



Maricopa County Environmental Services
Department

Air Quality Division

2002 Network Review

Acknowledgments

The Maricopa County Air Monitoring Unit continued to strive for excellence in maintaining the Maricopa County Air Monitoring Network. There were several changes to the network, including, establishing a new site and dealing with equipment problems. The Air Monitoring Unit continues to be under the direct supervision of Warren Kusters. Two new technicians were hired this year (Tom Shorb and Robert Dyer). We would like to thank the other agencies that provided data and helpful comments. These include Arizona Department of Environmental Quality (ADEQ), Pinal County Air Quality Control District (PCAQCD), and Maricopa Association of Governments (MAG). We would especially like to thank all of the air monitoring staff for the excellent job they did in maintaining our air-monitoring network. They are Larry Seals, Tom Shorb, Gary Ensminger, Bill Searle, Dale Foster, Ben Davis, Trixie Torrez, Del Hawkins, Robert Dyer, and Marilyn McGilberry

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Abstract

The 2002 Annual Air Monitoring Network Review is being submitted by the Maricopa County Environmental Services Department (MCESD), Air Quality Division to the United States Environmental Protection Agency (USEPA) Region 9. The network review evaluates the adequacy of the ambient air-monitoring network with respect to the monitoring objectives and spatial scales. This is required by 40 CFR Part 58, Appendix F. The National Air Monitoring Stations (NAMS) and State and Local Air Monitoring Stations (SLAMS) are evaluated for their location and adequacy. Network changes, special projects, and data summaries are also included in the review.

Network Design

Ambient air monitoring networks are designed to sample air pollution in a variety of settings, assess the health welfare affects, and assist in determining sources of air pollution. In general, the following six basic monitoring objectives and five measuring scales are used to determine the network design (see Table -1, -2). Additional items such as availability of power, accessibility to site, security, geographic location, and fiscal and personnel resources are also used in determining feasibility of the network design.

Site Monitoring Objectives

(Table -1)

1. Determine highest concentrations expected to occur in the area covered by the network
2. Determine representative concentrations in areas of high population density
3. Determine the impact on ambient pollution levels of significant sources or source categories
4. Determine general background concentration levels
5. Determine the extent of regional pollutant transport from populated areas, with regards to the secondary standards (such as visibility impairment and effects on vegetation)
6. Determine the welfare-related impacts in more rural and remote areas

When establishing a new monitoring site or reviewing existing sites, one must link monitoring objectives to the physical location of the site. This can be done by correctly matching the spatial scale, which represents the sample of air around the monitor where pollutant concentrations are reasonably uniform, with the most appropriate monitoring objective. Thus, spatial scale represents the physical dimensions of the air parcel around the monitor, and monitoring objective represents the overall purpose of the monitor (see Table -1, -2). Combining the spatial scale with the monitoring objective gives the how and why air-monitoring sites are located in particular areas.

Spatial Measurement Scale

(Table -2)

Name	Define parameter (radius)
Micro Scale	0 to 100 meters
Middle Scale	100 to 500 meters
Neighborhood Scale	0.5 to 4 kilometers
Urban Scale	4 to 50 kilometers
Regional Scale	10 to 100s of kilometers

Since it is physically and fiscally impossible to monitor the air quality everywhere within the county, a representative sample of the air quality must be obtained. This sample is based on the monitoring objectives and the spatial measurement scale. For example, there might be several locations where the highest concentration of carbon monoxide is expected to occur. However, only one or two sites may be established to represent all of the high concentration areas. The same reasoning can be used for all criteria pollutants. This does not mean that the number of monitoring sites is fixed. To the contrary, the network must be dynamic enough to maintain a current representative sample of the air quality.

One of the underlying purposes of this review, other than statutory obligation, is to refine the monitoring network to ensure that the citizens of Maricopa County are provided with quality and relevant data. The data is used in a variety of different ways. Most importantly it is used to determine the attainment status for parts of Maricopa County. Mathematical models are created using the data to determine the effectiveness of control programs on pollution levels. Also, other models are created to determine the possible locations of new sites and help in pollution forecasts. Maricopa County also provides public access to the data by posting it on the Internet.

Special Projects and Network Changes

Air quality issues such as ozone attainment, the new 8-hr ozone standard, and permits for new power plants are diverse and controversial subjects for the citizens of Maricopa County. Since no policies can be made without quality data, the Maricopa County Air Monitoring Unit strives to provide the most reliable and relevant air monitoring data to the public. The following is a list of projects and changes that have occurred during the year 2002.

- I. Maricopa County continues to run part of its carbon monoxide (CO) monitors and ozone (O₃) monitors on a seasonal basis (Table -3). Having part of the network operating seasonally allows us to upgrade instruments, perform preventive maintenance, expand the life expectancy of the instruments, reduce replacement costs, and better utilize our QA and QC resources on the remaining instruments.

Seasonal Monitors

(Table -3)

Seasonal Carbon Monoxide monitors (Sept. 1- Apr. 1)	Seasonal Ozone monitors (Apr. 1 – Oct. 1)
1. Glendale Site	1. Cave Creek Site
2. Maryvale Site	2. Falcon Field Site
3. Mesa Site	3. Glendale Site
4. North Phoenix Site	4. Humboldt Mountain Site
5. South Phoenix Site	5. Maryvale Site
6. South Scottsdale Site	6. Mesa Site
7. Surprise Site	7. Rio Verde Site
8. Tempe Site	8. Surprise Site
9. West Chandler Site	9. Tempe Site
	10. West Chandler Site

- II. MCESD will shut down the ozone monitor at the Mesa site (04-013-1003). This closure is a result of the evaluation of the ozone network by MCESD, ADEQ, and the EPA. The equipment will be used to better characterize underrepresented sections of the valley. The nearest active ozone monitor is at the Tempe site (04-013-4005) three miles to the west.

The Maryvale site (04-013-3006) was determined to be a good candidate to move farther into the west valley.

- III. As of February 2002, MCESD was unable to receive any parts or services from the Dasibi Corporation, due to the company going out of business. Unfortunately, all of the our multi-gas calibrators and more than half of our ozone monitors, including transfer and primary standards were made by Dasibi (see ADDITIONAL COMMENTS).
- IV. MCESD continues to participate in the Joint Air Toxic Assessment Project (JATAP) in conjunction with ADEQ and Phoenix area Urban Tribal Communities. We have been providing space at our existing sites (South Phoenix and West 43rd) for Hazardous Air Pollutants (HAP) monitoring. We have assisted in building an emission inventory and determining new monitoring sites.
- V. MCESD continues its wintertime High Pollution Advisory (HPA) program. This program restricts residential wood burning and encourages alternate forms of transportation during times of high carbon monoxide or particulate levels.
- VI. MCESD participated in the Salt River Monitoring Study. The study was conceived to provide sufficient data to correct the inadequacy of the PM-10 SIP (see ADDITIONAL COMMENTS).
- VII. MCESD is continuing its distribution of pollution data to the public by posting our one-hour continuous data on the Internet. Additionally, MCESD continues to participate in the EPA Ozone Mapping website (see ADDITIONAL COMMENTS).
- http://www.maricopa.gov/envsvc/air/air_map.asp
 - <http://www.epa.gov/airnow>
- VIII. The Higley Site was established in the southeast valley for possible replacement of the Chandler Site. The Chandler Site may remain because of future freeway construction (see ADDITIONAL COMMENTS).
- IX. MCESD continues to evaluate the PM-10 network for possible additional sites for determining the impact on ambient pollution levels of significant sources or source categories. The significant sources would include industry and agriculture. Resource allocation, both financial and personnel, continue to remain an obstacle in establishing new monitoring sites

Data Summaries

CRITERIA AIR POLLUTANTS

The following discussion focuses on Maricopa County's Ambient Air Monitoring Network relative to the criteria pollutants and monitoring objectives of the National Air Monitoring Stations (NAMS), State and Local Air Monitoring Stations (SLAMS), and Special Purpose Monitors (SPM).

The MCESD Air Monitoring Unit maintained twenty-five ambient air-monitoring sites throughout Maricopa County (Table -4). The history of these sites range from 1961 (Central Phoenix) to 2002 (West 43rd Ave.). Land use patterns around these sites vary from heavy populated urban areas to sparsely populated rural settings.

Site elevation ranges from near the Salt River channel to the top of Humboldt Mountain. MCESD monitors for the following “criteria pollutants”: Carbon Monoxide, Ozone, Particulates, Nitrogen Dioxide, and Sulfur Dioxide. Since the levels have been consistently below national levels, MCESD no longer monitors for lead (Pb)

Maricopa County Ambient Air Monitoring Sites for 2002

(Table -4)

Sites	Site Abbr.	AIRS Code
Blue Point	BP	04-013-9702
Cave Creek	CC	04-013-4008
Chandler	CH	04-013-0021
Central Phoenix	CP	04-013-3002
Durango Complex	DC	04-013-9812
Falcon Field	FF	04-013-1010
Fountain Hills	FH	04-013-9704
Glendale	GL	04-013-2001
Greenwood	GR	04-013-3010
Higley	HI	04-013-4006
Humboldt Mountain	HM	04-013-9508
Maryvale	MA	04-013-3006
Mesa	ME	04-013-1003

Sites	Site Abbr.	AIRS Code
North Phoenix	NP	04-013-1004
Pinnacle Peak	PP	04-013-2005
Rio Verde	RV	04-013-9706
Salt River	SA	04-013-3007
South Phoenix	SP	04-013-4003
South Scottsdale	SS	04-013-3003
Surprise	SU	04-013-4007
Tempe	TE	04-013-4005
West Chandler	WC	04-013-4004
West 43 rd Ave.	WF	04-013-4009
W. Indian School Rd.	WI	04-013-0016
West Phoenix	WP	04-013-0019

Criteria Pollutant by Sites

(Table -5)

<u>O3</u>		<u>CO</u>		<u>PM-10</u>		<u>NO2</u>	<u>SO2</u>
BP (n)	<u>NP</u> (s)	CP (n)	WI (n)	<u>CH</u> (n)	<u>SA</u> (sp)	CP. (n)	CP (n)
CC (sp)	PP (s)	GL (s)	WP (n)	CP (n)	SP (n)	GR (s)	SS (n)
CP (n)	RV (s)	GR (s)	SU (sp)	DC (s)	SS (n)	SS (n)	
FF (s)	SP (s)	TE (sp)		HI (sp)	SU (sp)	TE (sp)	
FH (n)	SS (n)	MA (s)		GL (n)	WC (s)	WP (s)	
GL (s)	SU (sp)	ME (s)		GR (s)	WF (s)		
HM (s)	TE (sp)	NP (s)		<u>MA</u> (s)	WP (n)	(s) = SLAMS (n) = NAMS	
MA (s)	WC (s)	SP (s)		ME (s)		(sp) = Special Purpose	
<u>ME</u> (s)	WP (s)	SS (s)		NP (s)		Bold = changes to site	
		WC (s)				<u>Underline = changes to site are pending</u>	

Criteria pollutants are found all over the United States. These pollutants can injure health, harm the environment and cause property damage. EPA designates these pollutants criteria air pollutants because the agency has regulated them by first developing health-based criteria (science-based guidelines) as the basis for setting permissible levels. One set of limits (primary standard) protects against adverse health effects; another set of limits (secondary standard) is intended to prevent environmental and property damage. A geographic area that meets or surpasses the primary standard is called an “attainment area”; areas that don't meet the primary standard are called “non-attainment areas”. Although EPA has been regulating criteria air pollutants since the

1970 Clean Air Act was passed, many urban areas are classified as non-attainment for at least one criteria air pollutant. It has been estimated that about 121 million Americans live in non-attainment areas.

CARBON MONOXIDE (CO)

During 2002, thirteen CO monitors were reported as operational to the USEPA Aerometric Information and Retrieval System (AIRS). Three of the monitors were classified as NAMS, eight as SLAMS, and two reported as SPM (Table -5). For Calendar Year 2002, no exceedances of the CO 1-hour standard were recorded at any MCESD monitoring sites (see Table -6).

2002 1-HR CARBON MONOXIDE SUMMARY

(Table -6)

Site	CO 1-HR AVG. MAX. (PPM) Date	CO 1-HR AVG. 2 ND High (PPM) Date	Number of Exceedances	Number of Samples
Central Phoenix	6.0 01/26/02	5.8 01/07/02	0	8611
Glendale	4.1 12/29/02	3.9 12/28/02	0	4959
Greenwood	7.3 01/27/02	6.8 01/08/02	0	8480
Maryvale	8.0 01/18/02	6.9 01/08/02	0	5010
Mesa	4.9 01/07/02	4.6 01/08/02	0	4862
North Phoenix	4.5 01/15/02	4.5 03/05/02	0	5027
South Phoenix	6.5 02/01/02	6.5 11/22/02	0	5019
South Scottsdale	5.5 01/25/02	4.3 01/07/02	0	5019
Surprise	4.2 11/18/02	2.4 12/07/02	0	4943
Tempe	4.9 10/16/02	4.7 12/14/02	0	4730
West Chandler	3.5 11/22/02	3.0 02/02/02	0	5011
W. Indian School	7.7 01/18/02	7.3 02/12/02	0	8174
West Phoenix	8.6 01/18/02	7.4 01/08/02	0	8058

CO is the most widely distributed and most commonly occurring air pollutant. Total emissions of CO to the atmosphere exceed all other pollutants combined, on a weight basis. Fortunately, CO does not persist in the atmosphere, but is quickly converted to Carbon Dioxide (CO₂). CO can reach dangerous levels in very localized areas or hotspots such as heavily traveled intersections or city streets. In addition, CO has been implicated in ozone formation. Most people are familiar with CO and are aware that automobiles produce this deadly odorless and colorless gas. In Maricopa County, more than 70% of all the manmade CO comes from vehicle emissions. In fact, this gas is produced almost anytime something is burned. All substances that are living (plants, animals) or that were once living (wood, coal, oil, gasoline) are composed of carbon compounds. If these substances are burned in the presence of sufficient oxygen, the carbon is converted to CO₂ gas. If, as is often the case, not enough oxygen is present, carbon monoxide gas is produced. For example, high concentrations of CO can be found in cigarette smoke.

For Calendar Year 2002, no exceedances of the CO 8-hour standard were recorded at any MCESD monitoring site (see Table -7). The following is the 2002 data summary for 8-hour average carbon monoxide at Maricopa County monitoring sites.

2002 8-HR AVERAGE CARBON MONOXIDE SUMMARY
(Table -7)

Site	CO 8-HR AVG. MAX (PPM) Date	CO 8-HR AVG. 2 ND High (PPM) Date	Number of Exceedances
Central Phoenix	4.4 01/08/02	4.1 01/27/02	0
Glendale	3.2 12/29/02	2.7 01/16/02	0
Greenwood	5.4 01/27/02	5.1 01/08/02	0
Maryvale	5.0 12/15/02	5.0 01/08/02	0
Mesa	3.5 01/08/02	3.5 01/09/02	0
North Phoenix	3.2 03/20/02	2.7 01/16/02	0
South Phoenix	3.8 11/17/02	3.7 01/13/02	0
South Scottsdale	3.0 01/08/02	2.8 01/07/02	0
Surprise	1.2 11/18/02	1.1 12/16/02	0
Tempe	3.4 12/14/02	3.4 12/29/02	0
West Chandler	2.2 02/03/02	2.2 11/23/02	0
W. Indian School	5.5 12/14/02	5.4 12/07/02	0
West Phoenix	5.5 01/18/02	5.5 12/14/02	0

Carbon monoxide's danger lies in the extremely strong affinity that hemoglobin has for it. Hemoglobin, the special oxygen-transporting material in the red blood cell, has approximately 200 times stronger affinity for CO than for oxygen. Therefore, if both CO and O₂ are present the bonding between the CO and hemoglobin will prevent the O₂ from exchanging with your body. This puts a heavy burden on people with heart disease and can aggravate angina, but even healthy people can suffer from harmful side effects from CO. In 2002 Maricopa County achieved its sixth year of compliance with the eight-hour CO standard. However, the urbanized area of Maricopa County currently remains in serious non-attainment for carbon monoxide. The Maricopa Association of Governments (MAG) submitted a Revised MAG 1999 Serious Area CO Plan to the USEPA in March 2001. MAG is also preparing a maintenance plan for submission to the USEPA, so that Maricopa County can be re-designated an attainment area for carbon monoxide.

OZONE (O₃)

During 2002, eighteen ozone monitors were reported as operational in AIRS. Four of the monitors were identified as NAMS, eleven were identified as SLAMS, and three were identified as a Special Purpose Monitor (SPM) (Table -5).

For Calendar Year 2002, no exceedances of the ozone 1-hour average standard were recorded at Maricopa County NAMS / SLAMS monitoring sites (Table -8). The following is the 2002 data summary for the 1-hour average ozone at Maricopa County monitoring sites (Table -8).

2002 ONE HOUR OZONE SUMMARY
(Table -8)

Site	Max. (PPM) Date	2 ND High (PPM) Date	3 RD High (PPM) Date	4 TH High (PPM) Date	# of Exceed	Samples
Blue Point	.110 07/12/02	.104 08/16/02	.102 07/13/02	.098 07/24/02	0	8611
Cave Creek	.102 08/10/02	.100 06/07/02	.099 07/24/02	.096 6/05/02	0	4764
Central Phoenix	.123 07/11/02	.098 07/12/02	.089 07/10/02	.089 06/07/02	0	8298
Falcon Field	.113 07/12/02	.111 07/13/02	.101 07/24/02	.098 06/07/02	0	4934
Fountain Hills	.114 07/12/02	.107 07/13/02	.105 08/16/02	.101 08/10/02	0	8566
Glendale	.101 07/09/02	.099 07/11/02	.097 07/12/02	.090 06/28/02	0	4992
Humboldt Mt.	.124 07/12/02	.099 06/05/02	.098 06/18/02	.096 06/07/02	0	5045
Maryvale	.119 07/09/02	.111 07/11/02	.108 07/10/02	.094 07/17/02	0	4999
Mesa	.097 07/24/02	.091 07/12/02	.083 07/11/02	.083 08/17/02	0	6842
North Phoenix	.111 07/12/02	.104 07/09/02	.104 07/11/02	.100 07/24/02	0	8524
Pinnacle Peak	.115 07/12/02	.102 07/15/02	.101 07/09/02	.101 07/24/02	0	8498
Rio Verde	.101 08/16/02	.100 06/05/02	.099 07/13/02	.099 06/07/02	0	5014
South Phoenix	.104 07/11/02	.104 07/10/02	.091 07/12/02	.089 06/07/02	0	8566
South Scottsdale	.102 07/12/02	.094 07/13/02	.093 07/11/02	.092 06/07/02	0	8368
Surprise	.098 07/09/02	.091 06/06/02	.086 06/18/02	.086 05/13/02	0	4820
Tempe	.100 07/11/02	.097 07/24/02	.096 08/17/02	.096 06/07/02	0	5018
West Chandler	.110 07/10/02	.101 07/13/02	.097 08/08/02	.096 07/11/02	0	4984
West Phoenix	.123 07/11/02	.116 07/09/02	.097 07/17/02	.095 07/10/02	0	8548

Indicates <75% data available

In 2002 Maricopa County achieved its sixth year of compliance with the one-hour standard. However, the urbanized area of Maricopa County currently retains its designation as a serious non-attainment area. MAG is preparing a maintenance plan for submission to the USEPA to allow Maricopa County to be re-designated to an attainment area for the one-hour ozone standard.

On July 18, 1997 the Environmental Protection Agency promulgated a new ozone standard to ensure a more effective and efficient protection of public health and the environment. The new purposed Primary Standard for ozone is 0.08 ppm. Compliance with the standard is determined by averaging the 4th highest eight-hour average over a three-year period. This three-year average must be less than or equal to 0.08 ppm. It should be noted that US Supreme Court has recently allowed the USEPA to implement the new ozone standard.

For Calendar Year 2002, there were sixteen sites that exceeded the eight-hour primary standard for ozone. The following is the 2002 data summary for eight-hour Ozone at Maricopa County monitoring sites (Table -9). Additionally, three sites violated the eight-hour primary standard (Table -18)

2002 PROPOSED 8-HR AVERAGE OZONE SUMMARY
(Table -9)

Site	8-HR MAX (PPM) Date	2 ND HIGH (PPM) Date	3 RD HIGH (PPM) Date	4 TH HIGH (PPM) Date	Number of DAYS ≥ .085
Blue Point	.091 06/06/02	.089 07/12/02	.088 06/07/02	.086 07/13/02	5
Cave Creek	.090 06/05/02	.089 06/07/02	.089 06/06/02	.086 07/09/02	4
Central Phoenix	.088 07/11/02	.084 07/09/02	.082 07/12/02	.076 06/05/02	1
Falcon Field	.093 07/12/02	.092 07/24/02	.086 06/07/02	.084 06/06/02	3
Fountain Hills	.092 06/06/02	.092 07/12/02	.091 06/05/02	.086 06/07/02	5
Glendale	.094 07/09/02	.088 07/11/02	.083 07/10/02	.083 05/13/02	2
Humboldt Mt.	.102 07/21/02	.091 06/05/02	.090 06/06/02	.090 06/18/02	8
Maryvale	.107 07/09/02	.095 07/11/02	.094 07/10/02	.084 07/12/02	3
Mesa	.082 07/12/02	.073 07/11/02	.073 07/09/02	.072 07/24/02	0
North Phoenix	.093 07/09/02	.089 07/11/02	.088 07/12/02	.085 06/06/02	5
Pinnacle Peak	.089 07/12/02	.086 06/06/02	.085 07/15/02	.084 07/24/02	3
Rio Verde	.089 06/06/02	.088 06/07/02	.085 06/05/02	.085 06/04/02	4
South Phoenix	.090 07/11/02	.086 07/10/02	.082 07/12/02	.081 06/05/02	2
South Scottsdale	.087 07/12/02	.079 07/09/02	.079 07/11/02	.079 06/05/02	1
Surprise	.083 06/06/02	.080 07/09/02	.080 06/18/02	.079 05/13/02	0
Tempe	.086 07/12/02	.085 07/11/02	.083 06/07/02	.080 06/06/02	2
West Chandler	.094 07/10/02	.085 07/11/02	.083 07/12/02	.083 08/08/02	2
West Phoenix	.103 07/11/02	.100 07/09/02	.084 07/10/02	.084 07/12/02	2

Indicates <75% data available

Ozone is a naturally occurring compound in which three oxygen atoms combine together. This is an unstable combination, and ozone is continually going through a natural cycle of being formed and then converting back to the more stable “normal” double oxygen compound. The cycle occurs fairly rapidly. In the stratosphere (6 miles and more above the earth), natural ozone has a beneficial effect of screening out harmful ultraviolet light from the sun. Ozone is a major component of the brown haze smog in our breathing air. Ozone is not directly emitted into the air, but rather forms in a complex reaction that involves heat, sunlight, and a “soup” of toxic pollutants, especially Volatile Organic Compounds (VOCs). Some of the most common sources are gasoline vapors, chemical solvents, and combustion products of fuels and consumer products. Ozone is created by sunlight acting on nitrates (NO_x) and VOCs from motor vehicles and stationary sources, and can be carried hundreds of miles from their origins. Ozone affects the respiratory system in people, animals, and the growth of plants.

PARTICULATE MATTER (PM-10)

During 2002, sixteen PM-10 monitors were reported as operational in AIRS. Six monitors were identified as NAMS, seven were identified as SLAMS, and three were identified as SPM (Table -5). The Central Phoenix site (CP) has both a continuous Tapered Element Oscillating Microbalance (TEOM) monitor and a 6-day SSI High Volume Monitor.

For Calendar Year 2002, there were five exceedances of the PM-10 twenty four-hour standard. Additionally, there were eight sites that exceeded the PM-10 annual standard (Table -10). For Calendar Year 2002, there were six sites that violated the PM-10 24-hour standard and five sites that violated the PM-10 annual standard (Table -16, -17). The following is the 2002 data summary for particulate pollution at Maricopa County monitoring sites (Table -10).

2002 PARTICULATE SUMMARY
(Table -10)

Site	24hr Avg. Max. (µg/m3)	24hr Avg. 2 nd High (µg/m3)	Number of Exceedances	Expected Exceedances	Annual Avg. (µg/m3)	Completeness Percentage (%)
Central Phoenix	81	76	0	0	43	100
Chandler	128	117	0	0	* 56	100
Durango Complex	* 232	* 158	2	12	* 70	100
Glendale	88	85	0	0	40	98
Greenwood	116	102	0	0	* 55	100
Higley	138	134	0	0	* 62	95
Maryvale	142	90	0	0	45	92
Mesa	102	86	0	0	38	100
North Phoenix	80	72	0	0	37	100
Salt River	* 249	* 174	2	12	* 80	98
South Phoenix	137	123	0	0	* 60	100
South Scottsdale	64	62	0	0	37	100
Surprise	81	67	0	0	32	97
West Chandler	80	77	0	0	38	100
West Forty Third	* 172	135	1	6	# 68	75
West Phoenix	122	98	0	0	* 52	100

* Indicates an Exceedance of the Standard # Indicates <75% data available

Particulate Matter is the term for solid or liquid particles found in the air. While some particles are large or dark enough to be seen as soot or smoke, others can only be seen through an electron microscope. In 1987 the EPA replaced the TSP (Total Suspended Particulates) air quality standard with a PM-10 (particles measuring less than ten microns) Standard. Research found that PM-10 has the ability to reach the lower regions of the respiratory tract. PM-10 affects the respiratory system in people and animals. Particulates that have high acid levels can cause damage to man-made materials and reduce visibility.

On July 2, 2002 (67 FR 44369), EPA found the state implementation plan (SIP) for the Metropolitan Phoenix (Maricopa County), Arizona serious PM-10 non-attainment area to be inadequate to attain the 24-hour particulate (PM-10) air quality standard at the Salt River monitoring site. Under authority from the Clean Air Act, EPA has required a SIP revision to be submitted by the State of Arizona to correct the inadequacy.

Fine particles (PM-2.5 particles measuring less than 2.5 microns) are respirable. They enter the body and are deposited in the pulmonary tissues. Epidemiological studies have shown a causal relationship between particulates and excess mortality, aggravation of bronchitis, and small reversible changes in the pulmonary function in children. Currently, Maricopa County does not operate any PM 2.5 monitors. However, the

Arizona Department of Environmental Quality (ADEQ) does operate seven PM 2.5 monitors within Maricopa County. They are the Estrella, Palo Verde, Greenwood, Supersite, Tempe Community Center, Desert West, Magnet School Traditional (which was moved to MCESD West Phoenix site June 13, 2000), and ASU West sites. ADEQ reports the PM-2.5 data in their annual report.

NITROGEN DIOXIDE (NO₂)

All parts of Maricopa County are in attainment for nitrogen dioxide. During 2002, five NO₂ monitors were operational and were reported in AIRS. Two monitors were designated as NAMS monitors, two designated as SLAMS, and one was designated as SPM (see Table -5).

For Calendar Year 2002, no exceedances of the NO₂ annual standard were recorded at Maricopa County NAMS/SLAMS monitoring sites (see Table -11).

2002 NITROGEN DIOXIDE SUMMARY

(Table -11)

Site	NO2 Avg. 1-HR Max. (PPM) Date	NO2 Avg. 1-HR 2 ND High (PPM) Date	Number of Samples	Annual Avg. (PPM)
Central Phoenix	.087 02/04/02	.085 01/07/02	8169	.029
Greenwood	.108 01/08/02	.108 01/16/02	8470	.035
South Scottsdale	.069 06/06/02	.066 04/21/02	8389	.024
Tempe	# .078 01/07/02	# .075 01/15/02	3765	# .024
West Phoenix	# .099 01/08/02	# .099 05/13/02	4569	#.029

* Indicates an Exceedance of the Standard # Indicates <75% data available

The NO₂ monitors at the West Phoenix and Tempe sites were shut down during the last half of the year due to a lack of calibration equipment. Both monitors were put back into service in January 2003.

NO₂ belongs to a family of highly reactive gases called nitrogen oxides. These gases form when fuel is burned at high temperatures, and are emitted primarily from automobile exhaust and power plants. Exposure to nitrogen dioxide can irritate the lungs and lower resistance to respiratory infections, particularly in people with existing respiratory illness such as asthma.

SULFUR DIOXIDE (SO₂)

Maricopa County is in attainment for SO₂. During 2002, two SO₂ monitors were operational and were reported in AIRS. Both of these monitors were designated NAMS sites (see Table -5). For Calendar Year 2002 no exceedances of the SO₂ annual, 24-hour, or 3-hour standard were recorded at Maricopa County monitoring sites (see Table -12).

2002 SULFUR DIOXIDE SUMMARY

(Table -12)

Site	3-HR MAX (PPM) Date	3-HR 2 nd High (PPM) Date	24-HR MAX (PPM) Date	Annual Avg. (PPM)	Number of Exceed.	Number Samples
Central Phoenix	.019 01/07/02	.016 01/08/02	.014 01/08/02	.003	0	8026
South Scottsdale	.018 04/10/02	.010 10/20/02	.004 01/07/02	.002	0	8053

* Indicates an Exceedance of the Standard

SO₂ is emitted largely from burning high-sulfur coal, oil, and diesel fuel. Because this gas is usually found in association with particulate pollution, as SO₂ is the precursor for fine sulfate particles, separating the health effects of these two pollutants is difficult. Together SO₂ and PM-10 make up a major portion of the pollutant load in many cities, acting separately and in concert to damage public health.

LEAD / TSP.

The monitoring of Lead/TSP. was discontinued in 1997.

DATA COMPLETENESS

The following is a summary of the data completeness for all of the criteria pollutants (Table –13).

(Table –13)

	Actual amount of data collected	Number of Scheduled Samples	Data Completeness * (collected/schedule)
Carbon Monoxide	77,891	82,104	94.9%
Ozone	119,391	123,600	96.6%
PM-10	949	970	97.8%
PM-10 (continuous)	7,840	8,760	89.5%
Nitrogen Dioxide	33,362	43,800	76.2%
Sulfur Dioxide	16,254	17,520	92.8%
Total	255,687	276,754	92.4%

NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS)

(Table –14)

Pollutant	Averaging Time	Primary Standard	Secondary Standard
Carbon Monoxide (CO)	1-hr	35 PPM	
	8-hr	9 PPM	
Ozone (O ₃)	1-hr	0.12 PPM	0.12 PPM
	8-hr	0.08 PPM	0.08 PPM
Nitrogen Dioxide (NO ₂)	Annual	0.05 PPM	0.05 PPM
Particulate Matter (PM-10)	24-hr	150 µg/m ³	150 µg/m ³
	Annual	50 µg/m ³	50 µg/m ³
Sulfur Dioxide (SO ₂)	3-hr	---	0.5 PPM
	24-hr	0.14 PPM	
	Annual	0.03 PPM	
Lead (Pb)	Quarterly	1.5 µg/m ³	1.5 µg/m ³

NAAQS EXCEEDANCE AND VIOLATION SUMMARY 2002

(Table-15)

Carbon Monoxide	No Exceedances of the 1-hr or 8hr NAAQS standard were logged		
Ozone	No Exceedances of 1-hr NAAQS were logged. See Table -9 - for 8-hr summary		
Nitrogen Dioxide	No Exceedances of NAAQS were logged		
Sulfur Dioxide	No Exceedances of NAAQS were logged		
Particulates	There were two days where at least one monitor exceeded the 24 hr.		
	Site	Date	Value
	DC	1/8/02	158 ug/m ³
	DC	4/26/02	232 ug/m ³
	SA	1/8/02	174 ug/m ³
	SA	4/26/02	249 ug/m ³
	WF	4/26/02	172 ug/m ³
	Eight sites exceeded the PM-10 Annual standard		
	Site	Value	
	CH	56 ug/m3	
	DC	70 ug/m3	
	GR	55 ug/m3	
	HI	62 ug/m3	
	SA	80 ug/m3	
	SP	60 ug/m3	
	WF	68 ug/m3	
	WP	52 ug/m3	

VIOLATIONS OF THE 24HR PARTICULATE STANDARD

The 24hr NAAQS for particulates is violated when the expected occurrence of exceedances (samples greater than or equal to 150 ug/m³) is greater than one over three consecutive years

(Table –16)

Site	2000		2001		2002		<u>Expected</u> <u>Exceedance Rate</u> <u>24hr Avg.</u>
	Max. 24hr	No. of Exp. Exc.	Max. 24hr	No. of Exp. Exc.	Max. 24hr	No. of Exp. Exc.	
Central Phoenix	135	0	124	0	81	0	0
Chandler	202	6.6	146	0	128	0	2
Durango Complex	300	11.8	189	6	232	12	10
Glendale	122	0	110	0	88	0	0
Greenwood	164	11.8	145	0	116	0	4
Higley	# 327	# 8.3	176	6	138	0	< 75%
Maryvale	173	6.1	123	0	142	0	2
Mesa	126	0	98	0	102	0	0
North Phoenix	114	0	99	0	80	0	0
Salt River	244	42.7	281	49	249	12	35
South Phoenix	175	6.1	143	0	137	0	2
South Scottsdale	100	0	110	0	64	0	0
Surprise	NA	NA	107	0	81	0	< 75%
West Chandler	135	0	134	0	80	0	0
West Forty Third	NA	NA	NA	NA	172	6	< 75%
West Phoenix	151	0	142	0	122	0	0

■ Indicates violation of standard # Indicates <75% data available

VIOLETIONS OF THE ANNUAL PARTICULATE STANDARD

The Annual NAAQS for particulates is violated when the three-year average of the annual averages is more than or equal to 50 ug/m³

(Table –17)

Site	2000 Annual Avg. ug/m ³	2001 Annual Avg. ug/m ³	2002 Annual Avg. ug/m ³	<u>Three Year Average ug/m³</u>
Central Phoenix	46	38	43	42
Chandler	57	48	56	54
Durango Complex	70	58	70	66
Glendale	41	33	40	38
Greenwood	61	49	55	55
Higley	# 72	50	62	< 75%
Maryvale	48	38	45	44
Mesa	37	30	38	35
North Phoenix	37	30	37	35
Salt River	101	94	80	92
South Phoenix	61	50	60	57
South Scottsdale	40	33	37	37
Surprise	Not Operating	27	32	< 75%
West Chandler	44	34	38	39
West Forty Third	Not Operating	Not Operating	68	< 75%
West Phoenix	53	43	52	49

■ Indicates violation of standard # Indicates <75% data available

VIOLATIONS OF THE PROPOSED 8-HR OZONE STANDARD 2002 SUMMARY

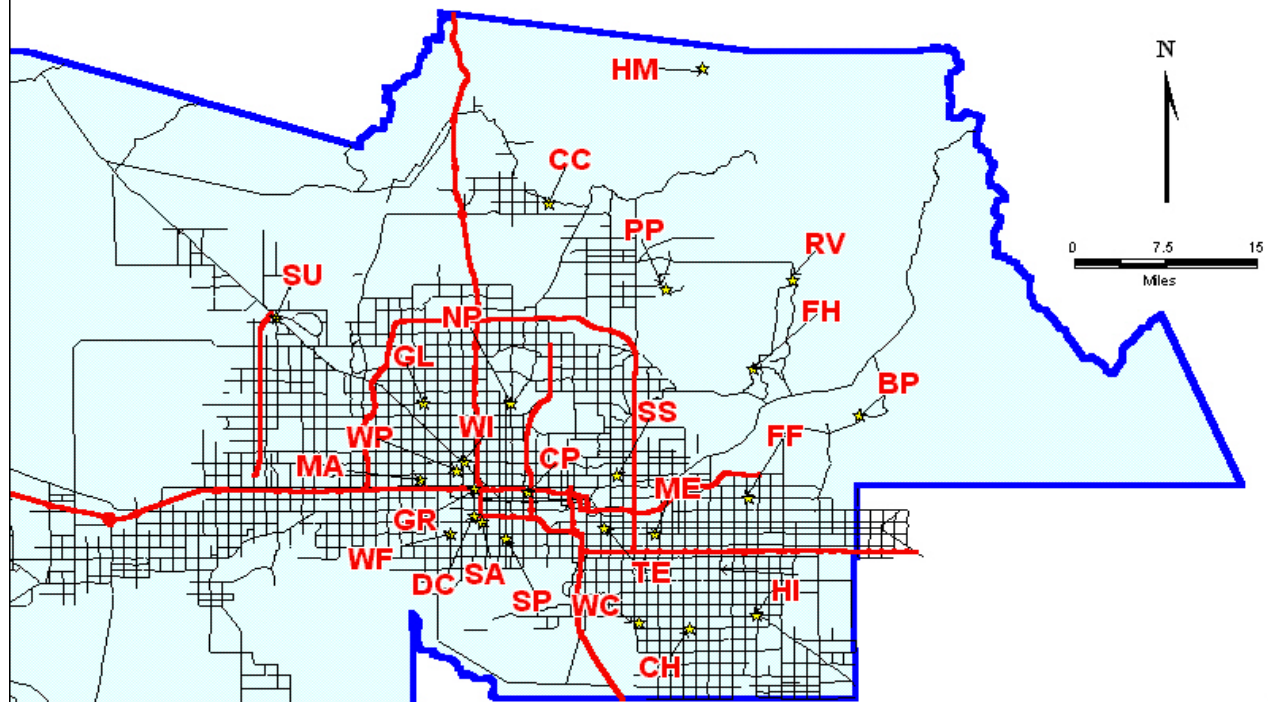
The 8-hr avg. NAAQS for ozone is violated when the three-year average of the fourth high is greater than .08 ppm. Because of mathematical rounding the value is actually .085 ppm or greater.

(Table –18)

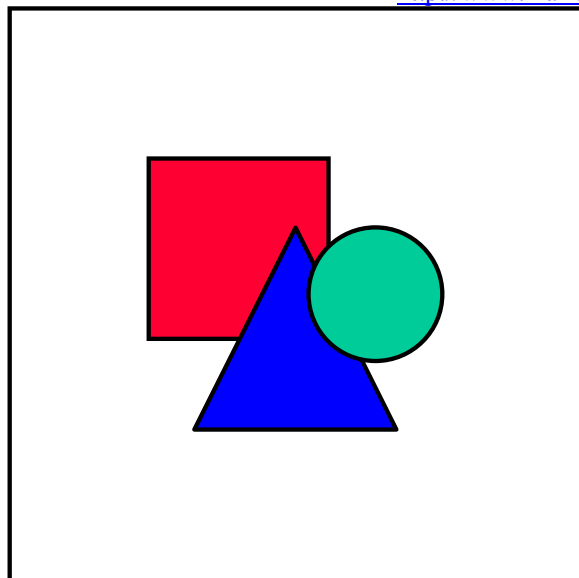
Site	2000 4 th high PPM	2001 4 th high PPM	2002 4 th high PPM	3 Yr. Avg. of 4th high PPM
Blue Point	.087	.080	.086	.084
Cave Creek	< 75%	.083	.086	NA
Central Phoenix	.076	.075	.076	.075
Falcon Field	.075	.081	.084	.080
Fountain Hills	.085	.083	.086	.084
Glendale	.081	.078	.083	.080
Humboldt Mt.	.082	.085	.090	.085
Maryvale	.080	.074	.084	.079
Mesa	.075	.074	.072	.073
North Phoenix	.086	.086	.085	.085
Pinnacle Peak	.086	.085	.084	.085
Rio Verde	.086	.083	.085	.084
South Phoenix	.083	.076	.081	.080
South Scottsdale	.080	.079	.079	.079
Surprise	<75%	.071	.079	NA
Tempe	.078	.079	.080	.079
West Chandler	<75%	.078	.083	NA
West Phoenix	.081	.075	.084	.080

■ Indicates violation of standard # Indicates <75% data available

MONITORING SITES SUMMARY **Maricopa County Air Monitoring Sites - 2002**



http://www.maricopa.gov/sbeap/AIR_MONI.HTM



{PRIVATE}Site Abbr.

Site Name

Site Location

BP

Blue Point

Usery Pass & Bush Highway

CC

Cave Creek

32nd St. & Carefree Highway

CH

Chandler

Pecos & McQueen

CP

Central Phoenix

19th St & Roosevelt

DC

Durango Complex

27th Ave. & Durango St.

FF

Falcon Field

McKellips & Greenfield

FH

Fountain Hills

Palisades & Fountain Hills Blvd.

GL

Glendale

59th Ave & W. Olive

GR

Greenwood

27th Ave. & Interstate 10

HI	Higley Site	Chandler Blvd. & Higley Rd.
HM	Humboldt Mountain	Top of Humboldt Mountain
MA	Maryvale	61 st Ave. & Encanto
ME	Mesa	Broadway Rd. & Alma School Rd.
NP	North Phoenix	7th Street & Dunlap Avenue
PP	Pinnacle Peak	Pima Rd & Pinnacle Peak
RV	Rio Verde	Forest Rd & Del Ray Ave.
SA	Salt River Site	22 nd Ave. & Lower Buckeye
SP	South Phoenix	Central Ave. & Broadway
SS	South Scottsdale	Scottsdale Rd. & Thomas Rd.
SU	Surprise	Reems Rd. and Grand Ave.
TE	Tempe Site	Apache Blvd. & College Ave.
WC	West Chandler	Ellis Rd. & Frye Blvd.
WF	West Forty Third	43 rd Ave. & Broadway Rd.
WI	W. Indian School	33 rd Ave. & W. Indian School. Rd.
WP	West Phoenix	39 th Ave. & Earll Dr.

Site Specifications

Site	Latitude	Longitude	Site Location	AIRS ID
BP	33: 33' 09.263"	-111: 36' 25.465"	Usery Pass & Bush Highway	04-013-9702
CC	33: 49.32'	-112: 1.02'	32nd St. & Carefree Highway	04-013-4008
CH	33: 17' 09.630"	-111: 49' 03.691"	Pecos & McQueen	04-013-0021
CP	33: 27' 29.130"	-112: 02' 28.809"	19th St & Roosevelt	04-013-3002
DC	33: 25' 60"	-112: 07' 12"	27th Ave. & Durango St.	04-013-9812
FF	33: 27' 09.371"	-111:43' 58.462"	McKellips & Greenfield	04-013-1010
FH	33: 36' 39.545"	-111: 40' 16.368"	Palisades & Fountain Hills Blvd.	04-013-9704
GL	33: 34' 09.487"	-112: 11' 26.855"	59th Ave & W. Olive	04-013-2001
GR	33: 27' 38.872"	-112: 07' 00.526"	27th Ave. & Interstate 10	04-013-3010
HI	33: 18.47'	-111: 43.33'	Higley Rd. & Chandler Blvd	04-013-4006
HM	33: 58' 53.255"	-111: 47' 50.478"	Top of Humboldt Mountain	04-013-9508
MA	33: 28' 28.611"	-112: 11' 32.055"	61st Ave. & Encanto	04-013-3006
ME	33: 24' 37.798"	-111: 51' 51.518"	Broadway Rd. & Alma School Rd.	04-013-1003
NP	33: 33' 37.055"	-112: 03' 55.797"	7th Street & Dunlap Avenue	04-013-1004
PP	33: 42' 43.440"	-111: 51' 05.644"	Pima Rd & Pinnacle Peak	04-013-2005
RV	33: 43' 06.418"	-111: 40' 16.142"	Forest Rd & Del Ray Ave.	04-013-9706
SA	33: 25' 03.788"	-112: 06' 12.194"	22nd Ave. & Lower Buckeye	04-013-3007
SP	33: 24' 12.410"	-112: 04' 23.196"	Central Ave. & Broadway	04-013-4003
SS	33: 28' 46.049"	-111: 54' 59.250"	Scottsdale Rd. & Thomas Rd.	04-013-3003
SU	33: 39.18'	-112: 22.65'	Reems Rd & Grand Ave	04-013-4007
TE	33: 24.67'	-111:56.10'	College Ave. & Apache Blvd.	04-013-4005
WC	33: 17.93'	-111: 53.04'	Ellis St. & Frye Rd.	04-013-4004
WF	33: 24.37'	-112: 88.66'	43 rd Ave. & Broadway Rd.	04-013-4009
WI	33: 29' 40.950"	-112: 07' 48.825"	33rd Ave. & Indian School Rd.	04-013-0016

WP	33: 29' 01.280"	-112: 08' 31.463"	39th Ave. & Earll Dr.	04-013-0019
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Site Instrument Setup

Sites	WS/WD	O ₃	CO	NOX	SO ₂	Press	Del-T	TEOM	Temp	Rel-Hum	Shelter Temp.	Rain	PM-10	Multi-Gas	Data Logger	Total
BP	1 s	1 n							1		1				1	5
CC	1 s	1 s *							1	1	1				1	6
CH	1 s												2 n		1	4
CP	1 s	1 n	1 n	1 n	1 n	1		1 s	1		1		1 n	1	1	12
DC	1 s					1			1				2 s		1	6
FF	1 s	1 s *									1				1	4
FH	1 s	1 n				1			1	1	1				1	7
GL	1 s	1 s *	1 s *			1					1		1 n		1	7
GR	1 s		1 s	1 s							1	1	1 s	1	1	8
HI	1 s								1	1			1 sp		1	5
HM		1 s *									1				1	3
MA		1 s *	1 s *								1		1 s		1	5
ME	1 s	1 s *	1 s *			1			1	1	1		2 s		1	10
NP	1 s	1 s	1 s *			1	1 s		1		1		1 s		1	9
PP	1 s	1 s									1				1	4
RV		1 s *													1	2
SA													1 n			1
SP	1 s	1 s	1 s *					1 sp			1		1 sp		1	7
SS	1 s	1 n	1 s *	1 n	1 n	1			1	1	1		1 n	1	1	12
SU		1 sp *	1 sp *								1		1 sp		1	5
TE	1 sp	1 sp *	1 sp *	1 sp			1 sp		1		1	1		1	1	10
WC	1 s	1 s *	1 s *				1 sp		1		1		1 s		1	8
WF	1 sp					1	1 sp		1				1 sp		1	6
WI	1 s		1 n								1				1	4
WP	1 s	1 s	1 n	1 s		1	1 s		1		1		2 n	1	1	12
Total	20	18	13	5	2	9	5	2	13	5	19	2	20	5	24	
n = NAMS s = SLAMS sp =SPM * = seasonal monitor									Total # of Active Sites		<u>25</u>		Total # of Active Instruments			<u>162</u>



Maricopa County Blue Point Air Monitoring Site

Blue Point (BP) (04-013-9702)

Location: Bush Highway and Usery Pass Road

Spatial Scale: Urban

Monitoring Objective: High Down Wind Maximum Concentrations, category (a)

Site Description: The Blue Point site became operational in July 1995 and is located in a Maricopa County Sheriff's Sub-Station in Tonto National Forest. This site represents the maximum ozone concentration, and urban scale down wind transport conditions. This site is located approximately 40 miles east of the Phoenix metropolitan area. Ozone is the only criteria pollutant monitored at this NAMS station. Wind speed and direction are also monitored at the site.

	2000	2001	2002
Max. 1-hr O ₃ Avg. (PPM)	0.108	0.111	0.110
Number exceedances 1-hr O ₃	0	0	0
Max. 8-hr O ₃ Avg. (PPM)	0.090	.0864	0.091
Number of Daily Exceedances >0.08	11	1	5
Three year avg. of 4 th High	* 0.088	* 0.085	0.084

*Indicates an Exceedance of the Standard



Maricopa County Cave Creek Air Monitoring Site

Cave Creek (CC) (04-013-4008)

Location: 32nd St. & Carefree Highway

Spatial Scale: Urban

Monitoring Objective: Down Wind Maximum Concentrations

Site Description: The Cave Creek site became operational in August 2001 and is located in the Maricopa County Cave Creek Recreation Area (Park Office). This site was chosen through discussions on modifying the ozone network for the new 8-hr ozone standard (see ADDITIONAL COMMENTS). Ozone is the only criteria pollutant monitored at this SLAMS station. Wind speed and direction are also monitored at the site.

	2000	2001	2002
Max. 1-hr O ₃ Avg. (PPM)	Not operating	0.112	0.102
Number exceedances 1-hr O ₃	Not operating	0	0
Max. 8-hr O ₃ Avg. (PPM)	Not operating	.100	0.090
Number of Daily Exceedances >0.08	Not operating	2	4
Three year avg. of 4 th High	Not operating	NA	NA



Maricopa County Central Phoenix Air Monitoring Site

Central Phoenix (CP) (04-013-3002)

Location: 1845 E. Roosevelt

Spatial Scale: Neighborhood

Monitoring Objective: High Population Exposure category (b)

Site Description: The Central Phoenix site has been in existence for over three decades and has provided a long-term historical database with high data recovery. The site is representative of high population exposure (greater than 5000 people per square mile) in the central Phoenix area. This site is a NAMS location for Carbon Monoxide, Ozone, PM-10, SO₂ and NO₂ criteria pollutants. Maricopa County also maintains a continuous (TEOM) monitor for PM10 daily forecasts during the winter season.

	2000	2001	2002
Max. 8-hr CO Avg. (PPM)	5.3	4.8	4.4
Number exceedances 8-hr CO	0	0	0
Max. 1-hr O3 Avg. (PPM)	0.094	0.091	0.123
Number exceedances 1-hr O3	0	0	0
Max. 8-hr O3 Avg. (PPM)	0.088	0.079	0.088
Number of Daily Exceedances >0.08	1	0	1
Three year avg. of 4 th High	0.078	0.077	0.075
Max. 24-hr PM-10 Avg. (ug/m3)	135	124	81
Number exceedances 24-hr PM-10	0	0	0
Annual PM-10 Avg. (ug/m3)	46	38	43
Annual NO2 Avg. (PPM)	0.031	0.028	0.029
Max. 24-hr SO2 Avg. (PPM)	0.015	0.009	0.014
Number of Exceedances	0	0	0
Annual SO2 Avg. (PPM)	0.002	.002	0.003



Maricopa County Chandler Air Monitoring Site

Chandler (CH) (04-013-0021)

Location: 1475 E. Pecos

Spatial Scale: Neighborhood

Monitoring Objective: High Population Exposure, category (b)

Site Description: The Chandler site is located on the property of the City of Chandler's Wastewater Treatment Plant (CWTP). The area immediately surrounding the CWTP was a low population density area; however, it is experiencing rapid residential growth. The site is a NAMS (category b) location for PM10 Particulates. Future air quality data from this location may be threatened since the CWTP has given notice of proposed expansion plans where the platform presently stands. Additionally, the site has become a storage location for street signs, water valves, and other municipal equipment. The site often measures a higher than expected particulate value, which has become more indicative of yard activity than reliable ambient air quality data. The present ADEQ site located at Higley is being considered as a replacement.

	2000	2001	2002
Max. 24-hr PM-10 Avg. (ug/m3)	202	146	128
Number exceedances 24-hr PM-10	1	0	0
Annual PM-10 Avg. (ug/m3)	* 57	48	*56

*Indicates an Exceedance of the Standard



Maricopa County Durango Complex Air Monitoring Site

Durango Complex (DC) (04-013-9812)

Location: 2702 AC Esterbrook Blvd.

Spatial Scale: Middle

Monitoring Objective: Maximum Concentration

Site Description: This site is located one mile northwest of the existing Salt River site in the Maricopa County Flood Control District storage yard. Sampling began on January 6, 1999 with the intent to replace the Salt River site. However, in 2000 the USEPA determined that the site is not equivalent to the Salt River site. Particulates (SLAMS PM-10) and wind speed and direction are monitored at the site. This site is part of the Salt River Monitoring Study (see ADDITIONAL COMMENTS).

	2000	2001	2002
Max. 24-hr PM-10 Avg. (ug/m3)	* 300	* 189	* 232
Number exceedances 24-hr PM-10	2	1	2
Annual PM-10 Avg. (ug/m3)	* 70	* 58	* 70

*Indicates an exceedance of the Standard



Maricopa County Falcon Field Mesa Airport Air Monitoring Site

Falcon Field (FF) (04-013-1010)

Location: 4530 E. McKellips

Spatial Scale: Urban

Monitoring Objective: High Down Wind Concentrations

Site Description: Ozone is the seasonal SLAMS criteria pollutant monitored at this station. Monitoring began in June of 1989. It is located near an airfield in a fire station with the area having a growing population density. Measurements are representative of ozone concentrations down wind over large portions of an urban area with dimensions of several to 50 or more kilometers.

	2000	2001	2002
Max. 1-hr O ₃ Avg. (PPM)	0.097	0.111	.113
Number exceedances 1-hr O ₃	0	0	0
Max. 8-hr O ₃ Avg. (PPM)	0.083	0.090	0.093
Number of Daily Exceedances >0.08	0	2	3
Three year avg. of 4 th High	0.080	.079	0.080



Maricopa County Fountain Hills Air Monitoring Site

Fountain Hills (FH) (04-013-9704)

Location: 16426 E. Palisades

Spatial Scale: Neighborhood

Monitoring Objective: High Down Wind Concentrations, category (b)

Site Description: The site is located at a Fountain Hills fire station. This site became operational in April of 1996. The site monitors ozone (NAMS category b) and wind speed and direction. This site is located approximately 15 miles downwind from the Phoenix metropolitan area. This site represents the high down wind concentrations on the fringes of the central basin district along the predominant summer/fall daytime wind direction.

	2000	2001	2002
Max. 1-hr O3 Avg. (PPM)	0.117	0.110	.114
Number exceedances 1-hr O3	0	0	0
Max. 8-hr O3 Avg. (PPM)	0.089	0.087	0.092
Number of Daily Exceedances >0.08	4	3	5
Three year avg. of 4 th High	* 0.085	* 0.085	* 0.085

* Indicates Violation of Standard



Maricopa County Glendale Air Monitoring Site

Glendale (GL) (04-013-2001)

Location: 6000 W. Olive

Spatial Scale: Neighborhood

Monitoring Objective: High Population Exposure

Site Description: The Glendale site was established over two decades ago and is located on the grounds of Glendale Community College in a growing residential area. Homes, various strip malls, food establishments, and parks surround the site. Seasonal Carbon Monoxide, Seasonal Ozone, (SLAMS) and PM-10 (NAMS category b) are the criteria pollutants monitored at this station.

	2000	2001	2002
Max. 8-hr CO Avg. (PPM)	3.5	3.1	3.2
Number exceedances 8-hr CO	0	0	0
Max. 1-hr O3 Avg. (PPM)	0.100	0.116	0.101
Number exceedances 1-hr O3	0	0	0
Max. 8-hr O3 Avg. (PPM)	0.088	0.092	0.094
Number of Daily Exceedances >0.08	1	2	2
Three year avg. of 4 th High	0.078	0.080	0.080
Max. 24-hr PM-10 Avg. (ug/m3)	122	110	88
Number exceedances 24-hr PM-10	0	0	0
Annual PM-10 Avg. (ug/m3)	41	33	40



Maricopa County Greenwood Air Monitoring Site

Greenwood (GR) (04-013-3010)

Location: Southwest Corner of 27th Avenue and I-10

Spatial Scale: Middle Scale

Monitoring Objective: High Population Exposure

Site Description: Monitoring began at this site in December 1993. The station is bordered on the north by Interstate-10, on the west and south by neighborhood homes, and to the east by Greenwood cemetery. Interstate-17 is approximately one mile to the east of the site. Carbon Monoxide, NO₂, and PM-10 are the criteria pollutants monitored at this SLAMS facility.

	2000	2001	2002
Max. 8-hr CO Avg. (PPM)	5.6	5.2	5.4
Number exceedances 8-hr CO	0	0	0
Max. 24-hr PM-10 Avg. (ug/m3)	* 164	145	117
Number exceedances 24-hr PM-10	2	0	0
Annual PM-10 Avg. (ug/m3)	* 61	49	* 55
Annual NO2 Avg. (PPM)	0.036	0.037	0.035

* Indicates an Exceedance of the Standard



Maricopa County Higley Air Monitoring Site

Higley (HI) (04-013-4006)

Location: 15400 S. Higley Rd. Gilbert AZ

Spatial Scale: Neighborhood

Monitoring Objective: High Population Exposure with High Concentration

Site Description: Originally, in 1994 ADEQ set up this site to monitor for background particulate concentrations near the urban limits of Maricopa County. Since then, urban expansion has enveloped the site, so it no longer serves their purpose. MCESD installed a PM-10 HI-VOL in the second quarter of 2000. The data from this site was compared to the Chandler Site and was found to be comparable. If the City of Chandler requests MCESD to remove the Chandler Site it is our intention for the Higley site to replace the Chandler site (see ADDITIONAL COMMENTS). The ADEQ removed its DICHOT PM10 sampler 4th quarter 2001.

	2000	2001	2002
Max. 24-hr PM-10 Avg. (ug/m3)	* 327	* 176	139
Number exceedances 24-hr PM-10	1	1	0
Annual PM-10 Avg. (ug/m3)	#72	50	* 62

* Indicates an Exceedance of the Standard # Indicates <75% Data Recovery



Maricopa County Humboldt Mountain Air Monitoring Site

Humboldt Mountain (HM) (04-013-9508)

Location: Humboldt Mountain Summit

Spatial Scale: Regional

Monitoring Objective: High Downwind Concentrations

Site Description: This site became operational in May 1996. The Humboldt Mountain site is located on Federal Aviation Agency property, in a National Forest Service building, in the Tonto National Forest. This site is located approximately 40 miles north- northeast from the Phoenix metropolitan area at an altitude of 5230 feet. Ozone is the only criteria pollutant that is monitored at this seasonal SLAMS site.

	2000	2001	2002
Max. 1-hr O ₃ Avg. (PPM)	0.095	0.098	0.124
Number exceedances 1-hr O ₃	0	0	0
Max. 8-hr O ₃ Avg. (PPM)	0.086	0.088	0.102
Number of Daily Exceedances >0.08	3	4	8
Three year avg. of 4 th High	* 0.087	* 0.085	* 0.085

* Indicates Violation of Standard



Maricopa County Maryvale Air Monitoring Site

Maryvale (MA) (04-013-3006)

Location: 6180 W. Encanto Blvd.

Spatial Scale: Neighborhood

Monitoring Objective: High Population Exposure

Site Description: Monitoring began at this site in November 1993. This monitoring station is located at the Maryvale Phoenix Police Station. The site is surrounded by residential neighborhoods with a City of Phoenix park to the West. Carbon Monoxide, Ozone, (seasonal) and PM-10 are the criteria pollutants monitored at this SLAMS station. The site was determined to be a good candidate to move into the far west valley.

	2000	2001	2002
Max. 8-hr CO Avg. (PPM)	7.0	7.6	5.0
Number exceedances 8-hr CO	0	0	0
Max. 1-hr O3 Avg. (PPM)	0.100	0.097	0.119
Number exceedances 1-hr O3	0	0	0
Max. 8-hr O3 Avg. (PPM)	0.091	0.083	0.107
Number of Daily Exceedances >0.08	1	0	3
Three year Avg. of 4 th High	0.082	0.078	0.079
Max. 24-hr PM-10 Avg. (ug/m3)	173*	123	142
Number exceedances 24-hr PM-10	1	0	0
Annual PM-10 Avg. (ug/m3)	48	38	45

* Indicates Violation of Standard



Maricopa County Mesa Air Monitoring Site

Mesa (ME) (04-013-1003)

Location: 370 S. Brooks

Spatial Scale: Neighborhood

Monitoring Objective: High Population Exposure

Site Description: This site is located at Brooks Reservoir at the western edge of the city near the Tempe border. It is centered in an area that is residential, industrial, and a small amount of agricultural. An open field borders the site on the west, commercial development to the north, light industry east and south of the site. Carbon Monoxide, Ozone, and PM-10 are the criteria pollutants monitored at this SLAMS site. To help conserve personnel and equipment resources the ozone monitor was permanently shut down as of November 1, 2002 (see ADDITIONAL COMMENTS)

	2000	2001	2002
Max. 8-hr CO Avg. (PPM)	4.3	2.9	3.5
Number exceedances 8-hr CO	0	0	0
Max. 1-hr O3 Avg. (PPM)	0.102	0.093	0.097
Number exceedances 1-hr O3	0	0	0
Max. 8-hr O3 Avg. (PPM)	0.089	0.078	.082
Number of Daily Exceedances >0.08	1	0	0
Three year Avg. of 4 th High	0.080	0.078	0.073
Max. 24-hr PM-10 Avg. (ug/m3)	126	98	102
Number exceedances 24-hr PM-10	0	0	0
Annual PM-10 Avg. (ug/m3)	37	30	38



Maricopa County North Phoenix Air Monitoring Site

North Phoenix (NP) (04-013-1004)

Location: 601 E. Butler

Spatial Scale: Neighborhood

Monitoring Objective: High Population Exposure

Site Description: This site is located in the Sunnyslope area of North Phoenix. Sunnyslope is an old established neighborhood, primarily residential. High-density population surrounds the site. CO, Ozone, and PM-10 (SLAMS) are monitored at this site, along with temperature inversion.

	2000	2001	2002
Max. 8-hr CO Avg. (PPM)	3.1	2.5	3.2
Number exceedances 8-hr CO	0	0	0
Max. 1-hr O3 Avg. (PPM)	0.107	0.110	0.111
Number exceedances 1-hr O3	0	0	0
Max. 8-hr O3 Avg. (PPM)	0.092	0.094	0.093
Number of Daily Exceedances >0.08	4	4	5
Three year Avg. of 4 th High	* 0.086	* 0.085	* 0.085
Max. 24-hr PM-10 Avg. (ug/m3)	114	99	80
Number exceedances 24-hr PM-10	0	0	0
Annual PM-10 Avg. (ug/m3)	37	30	37

* Indicates Violation of Standard



Maricopa County Pinnacle Peak Air Monitoring Site

Pinnacle Peak (PP) (04-013-2005)

Location: 25000 Windy Walk Way

Spatial Scale: Urban

Monitoring Objective: High Down Wind Concentrations

Site Description: This SLAMS site for ozone is located at a golf course country club and is surrounded by residential homes. It is located in a geographic area of low-density population (less than 2500 people per square mile). In previous years, ozone exceedances have been recorded due to transport of ozone and precursors from more urbanized areas of metro-Phoenix.

	2000	2001	2002
Max. 1-hr O ₃ Avg. (PPM)	0.117	0.107	0.115
Number exceedances 1-hr O ₃	0	0	0
Max. 8-hr O ₃ Avg. (PPM)	0.092	0.095	0.089
Number of Daily Exceedances >0.08	5	4	3
Three year Avg. of 4 th High	* 0.085	* 0.085	* 0.085

* Indicates an Violation of the Standard



Maricopa County Rio Verde Air Monitoring Site

Rio Verde (RV) (04-013-9704)

Location: 25608 N. Forest Rd.

Spatial Scale: Urban

Monitoring Objective: High Downwind Concentrations.

Site description: This seasonal ozone site became operational in spring of 1997. The monitor is located at the fire station / County Sheriff's office sub-station located in a residential area surrounded by the desert of Tonto National Forest. The site is eight miles north of the Fountain Hills NAMS station, on the edge of a Class I Wilderness Area.

	2000	2001	2002
Max. 1-hr O ₃ Avg. (PPM)	0.117	0.102	0.101
Number exceedances 1-hr O ₃	0	0	0
Max. 8-hr O ₃ Avg. (PPM)	0.089	0.084	0.089
Number of Daily Exceedances >0.08	5	0	4
Three year Avg. of 4 th High	NA	0.084	0.084

*Indicates an Exceedance of the Standard



Maricopa County Salt River Air Monitoring Site

Salt River (SA) (04-013-3007)

Location: 3045 S. 22nd Avenue

Spatial Scale: Middle Scale

Monitoring Objectives: Maximum Concentration and the impact of significant sources or source categories on ambient conditions

Site Description: Monitoring began at the Salt site on January 14, 1994. This site is located at a City of Phoenix vehicle maintenance yard in an industrial area. The site has one 6-day SS HI-VOL. particulate monitor. The main purpose of the monitor is to measure Maximum concentration and to determine the impact on ambient pollution levels of significant sources or source categories. The sources around the site include sand and gravel, metal recycling, pre-cast manufacturing, and paved and unpaved haul road. The entire site was shutdown as of December 31, 2002 at the conclusion of the Salt River Study (see ADDITIONAL COMMENTS).

	2000	2001	2002
Max. 24-hr PM-10 Avg. (ug/m3)	* 244	* 281	* 249
Number exceedances 24-hr PM-10	6	6	2
Annual PM-10 Avg. (ug/m3)	* 101	* 94	* 80

*Indicates an Exceedance of the Standard



Maricopa County South Phoenix Air Monitoring Site

South Phoenix (SP) (04-013-4003)

Location: Central and Broadway Rd.

Spatial Scale: Neighborhood

Monitoring Objective: High Population Exposure

Site Description: The site was reopened at its current location October 1999. The site is at the edge of a high population area, but also borders on a mixture of residential and commercial (retail stores, food establishments, and office parks) land use. The station has two high population areas (> 5000 people per mile²) north and west of the site. Carbon Monoxide, Ozone, and PM-10 (SLAMS) are the criteria pollutants monitored at this station.

	2000	2001	2002
Max. 8-hr CO Avg. (PPM)	5.9	4.5	3.8
Number exceedances 8-hr CO	0	0	0
Max. 1-hr O ₃ Avg. (PPM)	0.102	0.098	0.104
Number exceedances 1-hr O ₃	0	0	0
Max. 8-hr O ₃ Avg. (PPM)	0.087	0.086	0.090
Number of Daily Exceedances >0.08	3	1	2
Three year Avg. of 4 th High	0.078	0.078	.080
Max. 24-hr PM-10 Avg. (ug/m ³)	* 175	143	137
Number exceedances 24-hr PM-10	1	0	0
Annual PM-10 Avg. (ug/m ³)	* 61	50	* 60

* Indicates an Exceedance of the Standard



Maricopa County South Scottsdale Air Monitoring Site

South Scottsdale (SS) (04-013-3003)

Location: 2857 N. Miller

Spatial Scale: Urban Neighborhood

Monitoring Objective: High Population Exposure, category (b)

Site Description: The South Scottsdale site is located at the City of Scottsdale Fire Station. The area North of the site is defined as high density residential with over 5000 persons per square mile with surrounding residential density of (2500 to 5000 persons per square mile). This site is located 12 miles east of metropolitan Central Phoenix. Carbon Monoxide, (SLAMS) Ozone, NO₂, SO₂, and PM-10 (all NAMS) are the criteria pollutants monitored at this station.

	2000	2001	2002
Max. 8-hr CO Avg. (PPM)	3.3	3.2	3.0
Number exceedances 8-hr CO	0	0	0
Max. 1-hr O3 Avg. (PPM)	0.099	0.102	0.102
Number exceedances 1-hr O3	0	0	0
Max. 8-hr O3 Avg. (PPM)	0.087	0.089	0.087
Number of Daily Exceedances >0.08	1	1	1
Three year Avg. of 4 th High	0.077	0.077	0.079
Max. 24-hr PM-10 Avg. (ug/m3)	100	110	64
Number exceedances 24-hr PM-10	0	0	0
Annual PM-10 Avg. (ug/m3)	40	33	37
Annual NO2 Avg. (PPM)	0.030	0.021	0.024
Max. 24-hr SO2 Avg. (PPM)	0.018	0.006	0.004
Number of Exceedances	0	0	0
Annual SO2 Avg. (PPM)	0.001	0.001	0.002



Maricopa County Surprise Air Monitoring Site

Surprise (SU) (04-013-4007)

Location: 18600 N. Reems Rd

Spatial Scale: Neighborhood

Monitoring Objective: High Population Exposure

Site Description: The site is located at the City of Surprise Fire and Police Station #2. The site is at the edge of a growing population area in the northwest valley. The land use around the site consists of high-density housing, subdivisions of single family homes and light commercial (strip malls). The site started operations November 2000. Carbon Monoxide, Ozone, and PM-10 are the criteria pollutants monitored at this station.

	2000	2001	2002
Max. 8-hr CO Avg. (PPM)	# 1.0	1.2	1.2
Number exceedances 8-hr CO	0	0	0
Max. 1-hr O3 Avg. (PPM)	#0.049	0.093	0.098
Number exceedances 1-hr O3	0	0	0
Max. 8-hr O3 Avg. (PPM)	# 0.043	0.074	0.083
Number of Daily Exceedances >0.08	0	0	0
Three year Avg. of 4 th High	NA	NA	NA
Max. 24-hr PM-10 Avg. (ug/m3)	#	107	81
Number exceedances 24-hr PM-10	NA	0	0
Annual PM-10 Avg. (ug/m3)	#	27	32

* Indicates an Exceedance of the Standard # Indicates <75% data recovery



Maricopa County Tempe Air Monitoring Site

Tempe (TE) (04-013-4005)

Location: Apache Blvd. & College Ave.

Spatial Scale: Neighborhood Scale

Monitoring Objective: High Population Exposure

Site Description: The site was established in 2000. The site was established to fill in a spatial gap between the metropolitan Phoenix area and the city of Mesa. Since the Mesa ozone monitor will be shut down, the Tempe monitor will be used as a replacement. Ozone (SPM), Carbon Monoxide (SPM), and Nitrogen Dioxide (SPM) are monitored at the site. The NO₂ monitor was shutdown as of June 2002 because of the availability of calibration equipment (see ADDITIONAL COMMENTS).

	2000	2001	2002
Max. 8-hr CO Avg. (PPM)	# 3.7	3.2	3.4
Number exceedances 8-hr CO	0	0	0
Max. 1-hr O3 Avg. (PPM)	# 0.099	0.099	0.100
Number exceedances 1-hr O3	0	0	0
Max. 8-hr O3 Avg. (PPM)	# 0.086	0.089	0.086
Number of Daily Exceedances >0.08	1	1	2
Three year Avg. of 4 th High	NA	NA	0.079
Annual NO2 Avg. (PPM)	# 0.022	.022	# 0.024

* Indicates an Exceedance of the Standard # Indicates <75% data recovery



Maricopa County West Chandler Air Monitoring Site

West Chandler (WC) (04-013-4004)

Location: Frye Rd & Ellis

Spatial Scale: Neighborhood Scale

Monitoring Objective: High Population Exposure

Site Description: This site was set up in January 1995. The site was reopened in its current location in May 2000. The site is located ½ mile south of the old site location. A wide range of land uses surrounds the site. They include residential, agriculture, and heavy industry (semi conductor plants and liquid air storage). Carbon Monoxide, Ozone, and PM-10 are the criteria pollutants will continue to be monitored at this SLAMS site.

	2000	2001	2002
Max. 8-hr CO Avg. (PPM)	# 2.5	2.2	2.2
Number exceedances 8-hr CO	0	0	0
Max. 1-hr O3 Avg. (PPM)	# 0.100	0.105	0.110
Number exceedances 1-hr O3	0	0	0
Max. 8-hr O3 Avg. (PPM)	# 0.089	0.087	0.094
Number of Daily Exceedances >0.08	1	1	2
Three year Avg. of 4 th High	NA	NA	NA
Max. 24-hr PM-10 Avg. (ug/m3)	135	134	80
Number exceedances 24-hr PM-10	0	0	0
Annual PM-10 Avg. (ug/m3)	44	34	38

* Indicates an Exceedance of the Standard # Indicates <75% data available



Maricopa County West Forty Third Air Monitoring Site

West Forty Third (WF) (04-013-4009)

Location: 43rd Ave. & Broadway Rd.

Spatial Scale: Middle Scale

Monitoring Objective: Maximum Concentration

Site Description: Monitoring began at the site in the 2nd quarter of 2002. This site is located at a Maricopa County Department of Transportation storage lot. The site is surrounded by a combination of heavy industry and residential homes. The site has one 6-day SS HI-VOL. particulate monitor. The main purpose of the monitor is to measure maximum concentration and to determine the impact on ambient pollution levels of significant sources or source categories. The sources around the site include sand and gravel operations, auto and metal recycling, landfills, paved and unpaved haul roads, and cement casting (see ADDITIONAL COMMENTS section).

	2000	2001	2002
Max. 24-hr PM-10 Avg. (ug/m3)	not operating	not operating	# 172
Number exceedances 24-hr PM-10	not operating	not operating	1
Annual PM-10 Avg. (ug/m3)	not operating	not operating	# 68

* Indicates an Exceedance of the Standard # Indicates <75% data available



Maricopa County West Indian School Road Air Monitoring Site

West Indian School Rd. (WI) (04-013-0016)

Location: 3315 West Indian School Road

Spatial Scale: Micro-scale

Monitoring Objective: Maximum Pollutant Concentration and Impact of Significant Sources, category (a)

Site Description: The site is located at the City of Phoenix, Wellness Evaluation Center. This site is used to monitor micro-scale maximum concentrations and is based on high vehicular traffic. The Average Weekday Traffic (AWT) volume past this location on Indian School Road estimates 55,000 vehicles. The site is also in close proximity to Grand Ave. and 35th Ave., which have AWT volumes of about 35,000 vehicles. Carbon Monoxide is monitored at this NAMS site.

	2000	2001	2002
Max. 8-hr CO Avg. (PPM)	6.8	6.8	5.5
Number exceedances 8-hr CO	0	0	0

* Indicates an Exceedance of the Standard



Maricopa County West Phoenix Air Monitoring Site

West Phoenix (WP) (04-013-0019)

Location: 3847 W. Earll

Spatial Scale: Neighborhood

Monitoring Objective: High Population Exposure

Site Description: This site became operational in 1984. It is located about one-mile southwest of the West Indian School Road micro-scale CO monitor. The spatial scale for the West Phoenix site is neighborhood. It is located in an area of stable, high population density. Carbon Monoxide (NAMS), PM-10 (NAMS), Ozone (SLAMS), and NO₂ (SLAMS) are the criteria pollutants monitored at this site. The NO₂ monitor was shutdown as of July 2002 because of the lack of calibration equipment (see ADDITIONAL COMMENTS).

	2000	2001	2002
Max. 8-hr CO Avg. (PPM)	7.4	7.5	5.5
Number exceedances 8-hr CO	0	0	0
Max. 1-hr O3 Avg. (PPM)	0.099	0.099	0.123
Number exceedances 1-hr O3	0	0	0
Max. 8-hr O3 Avg. (PPM)	0.088	0.082	0.103
Number of Daily Exceedances >0.08	1	0	2
Three year Avg. of 4 th High	* 0.086	0.082	0.080
Max. 24-hr PM-10 Avg. (ug/m3)	151	142	122
Number exceedances 24-hr PM-10	0	0	0
Annual PM-10 Avg. (ug/m3)	* 53	43	* 52
Annual NO2 Avg. (PPM)	0.029	0.025	# 0.029

* Indicates an Exceedance of the Standard # Indicates <75% data available

ADDITIONAL COMMENTS

Dasibi

In early 2002 the Dasibi Corporation went out of business. The Dasibi Corp made all of the multi-gas calibrators and more than half of the ozone monitors operated by MCESD. Since that time MCESD Air Monitoring Unit has been unable to receive any consumables or replace parts from Dasibi. This lack of replacement parts greatly affected MCESD's ability to maintain our monitoring network. The NO₂ and ozone networks were the most effected.

Since every NO₂ monitor has to have its own multi-gas calibrators and QA and Bench Technicians also require their own calibrators, it was decided to shutdown two NO₂ monitors (04-013-0019 SLAMS, 04-013-4005 SPM) to conserve operational calibrators. They were shut down as of June 2002. MCESD did maintain a small supply of parts for the Dasibi ozone monitors and standards, however; this supply is quickly running out.

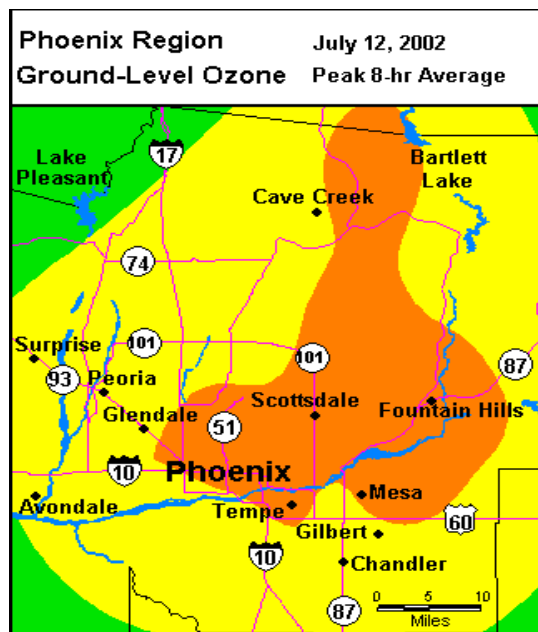
MCESD has implemented a long-term equipment replacement program. The specification and bid process for the new monitors took longer than expected which caused more delays in purchasing new monitors. The sheer number of ozone monitors and transfer and primary standards that need to be replaced is considerable (over 20). In mid October, we started to receive new equipment but, training, administrative functions, and getting them ready for the field proved to be very time consuming. By January 2003, we will have all of our new multi-gas calibrators in the field along with what is left of our older calibrators. These older calibrators are operating correctly, but we have no replacement parts.

EPA Ozone Mapping

One of the programs MCESD continues to participate in is the EPA's Environmental Monitoring for Public Access and Community Tracking (EMPACT) program. It is a presidential initiative designed to provide time-relevant environmental information in an easily understood format. One way in which the EMPACT Program provides easier access to pollution data is through the Ozone Mapping Project. This project employs the AIRNOW website <http://www.epa.gov/airnow> to provide real time air pollution (ozone and soon PM_{2.5}) maps for major metropolitan areas around the United States, including the Phoenix Metropolitan Area. The goals of the EPA's AIRNOW website are as follows:

- 1) Provide real-time air pollution data in an understandable, visual format.
- 2) Provide information about the public health and environmental effects of air pollution.
- 3) Provide the public with information about ways in which they can protect their health, and actions they can take to reduce pollution.

This website can be used as a tool for which the public can plan their daily activities and limit their exposure to air pollution. One-hour and eight-hour average peak ozone concentration maps (see Map -1) and a real-time eight-hour ozone animation map are provided. Colors on the map indicate different concentrations of ozone pollution. The one-hour average values



(Map -1)

are given in parts per billion. The eight-hour averages are converted into Air Quality Index (AQI) numbers. The AQI is based on the NAAQS. The index was developed to convert pollution measurements into a common index that the general public can more easily understand. Different colors on the map correspond to different categories of air quality and health impacts (Table -19).

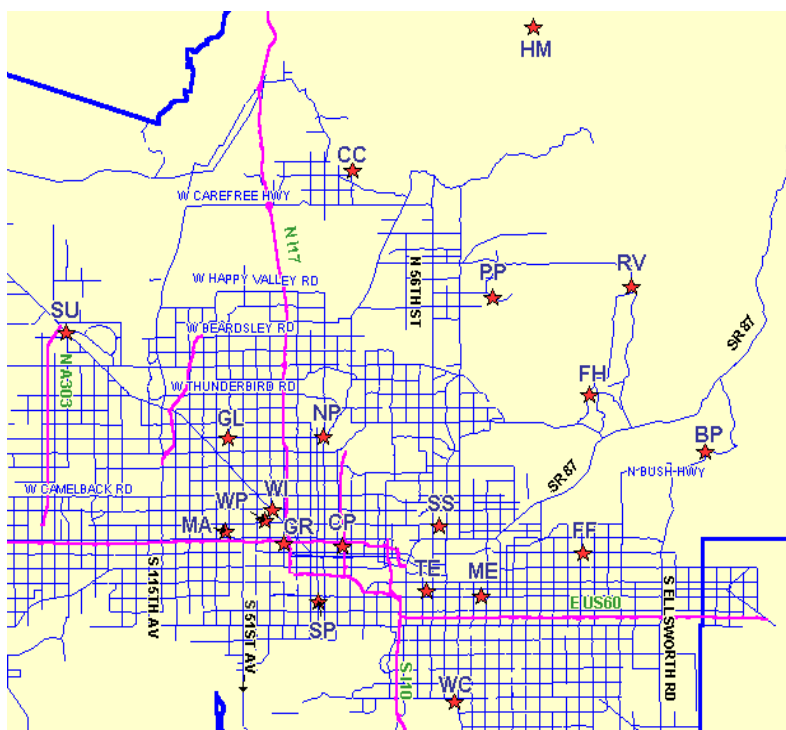
Air Quality Index
(Table -19)

Index	Color	Air Quality	Health Impact
0 - 50	Green	Good	No harmful effects expected.
51 - 100	Yellow	Moderate	Unusually sensitive people should consider limiting prolonged outdoor exertion.
101 - 150	Orange	Unhealthy for Sensitive Groups	Active children & adults, people with respiratory disease (i.e. asthma) should limit prolonged outdoor exertion.
151 - 200	Red	Unhealthy	Everyone should observe caution. Avoid prolonged outdoor exertion
201 - 300	Purple	Very Unhealthy	Avoid all outdoor exertion. Use extreme caution outdoors
301 - 500	Maroon	Hazardous	Everyone should avoid all outdoor exertion.

The animated map is updated every hour from 8am to 8pm seven days a week. Updates to the site will be made during the ozone season (April through October). Archived maps of the 2000, 2001, and 2002 ozone seasons are available. MCESD plans to continue with the project for the 2003 Ozone Season.

Maricopa County's Interactive Pollution Map

In keeping with our mission statement of "Ensuring a Safe and Healthy Environment" MCESD has brought real-time pollution data to the Internet. All of the MCESD continuous data will be available to the public through an interactive map (see Map -2). The air pollutants that are available include CO, ozone, NO₂, SO₂, and particulates. All of the values are currently one-hour averages. The information is updated on an hourly basis at half past the hour. Data can be accessed at this web address http://www.maricopa.gov/envsvc/air/air_map.asp



Salt River Air Monitoring Study

In May 1997, ADEQ submitted the Plan for Attainment of the 24-hour PM-10 Standard Maricopa County PM-10 Non-attainment Area, as a SIP revision. This plan, known as the micro-scale plan, included attainment and RFP demonstrations for the 24-hour PM-10 standard at the Salt River site. The attainment demonstration for the Salt River site showed that, with additional controls adopted by MCESD and the City of Phoenix's commitment to work cooperatively with MCESD to reduce particulate pollution, attainment at the site would occur by May 1998. EPA

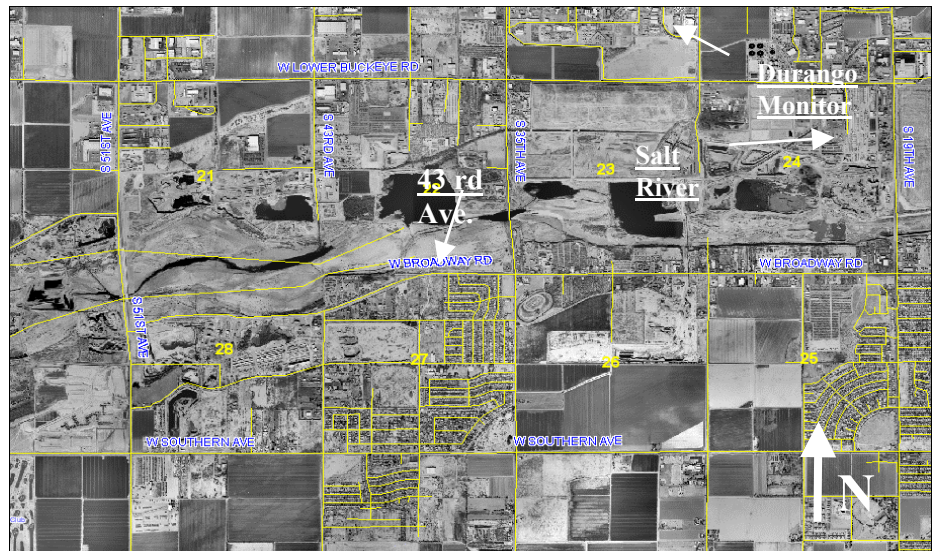
approved the attainment and RFP demonstrations for the Salt River site and Maricopa County's controls on August 4, 1997 (62 FR 41856). According to the approved attainment demonstration, the Salt River site should not have violated the 24-hour PM-10 standard after May 1998. The site however continues to violate the standard. Based on data recorded in EPA's AIRS, the Salt River monitor had 51 expected exceedances in 1999, 43 expected exceedances in 2000, and 19 expected exceedances through 3 quarters in 2001 or an average of 37 expected exceedances per year over the past three years. On July 2, 2002 (67 FR 44369), EPA found the state implementation plan (SIP) for the Metropolitan Phoenix (Maricopa County), Arizona serious PM-10 non-attainment area to be inadequate to attain the 24-hour particulate (PM-10) air quality standard at the Salt River monitoring site. Under authority from the Clean Air Act, EPA has required a SIP revision to be submitted by the State of Arizona to correct the inadequacy. The Salt River Monitoring Study was conceived to provide sufficient data to correct the inadequacy of the SIP.

The Salt River monitor is located at the City of Phoenix Service Center near 22nd Ave. and Lower Buckeye. In addition to the SIP revision, the City has requested that the site be removed by Jan 2003. The city is planning a large construction project on the existing site. MCESD and ADEQ have made considerable effort to find a suitable replacement site with comparably high PM-10 concentrations and a similar mix of industrial emissions. Two candidate sites (Durango and 43rd Ave) have been identified. They are both within two miles of the Salt River site (see Fig. 1). As part of the SIP revision, the ADEQ will conduct an analysis of the PM-10 concentrations and source attributions for the two alternative sites and compare them to the Salt River site. All additional monitoring for the study was stopped as scheduled on December 31, 2002.

Evaluation of Ozone Network for the New Eight-Hour Standard

Since the EPA will soon be implementing the new eight-hour ozone standard, environmental agencies around the Phoenix Metro Area held a workshop on modifying the existing ozone network. ADEQ provided several suggestions on modifying the network to maximize coverage and better utilize resources. Some of the major ideas for the MCESD ozone network are as follows:

Study Area



(Fig. 1)

1. The Lake Pleasant site should be moved to the Cave Creek area to better monitor ozone formation.
2. The Emergency Management site should be shutdown because it was determined to be redundant.
3. The Mesa ozone monitor should be shutdown because it was determined to be redundant.
4. An ozone monitor should be established in the area around the old Perryville site (west valley).
5. The Roosevelt Lake ozone monitor should be reestablished.
6. An ozone monitor should be established in the Gila Bend area southwest of the Phoenix Metro Area.

MCESD has moved the Lake Pleasant site to The Cave Creek Recreational Area. The Emergency Management site was shutdown in 2001. The Mesa ozone monitor was shut down as of November 1, 2002 to help conserve our resources. There is another ozone monitor three miles to the east at the Tempe site.

MCESD will establish a new site in the town of Buckeye (Far West Valley). To help conserve resources the Maryvale site (04-013-3006) will be shut down and moved to the Buckeye area. A NO₂ monitor will also be installed to monitor the impacts of the new power plants. Scarce equipment and personnel resources have caused this move to be put off until such resources can be found.

Chandler and Higley Sites

The City of Chandler informed MCESD of remodeling in the Wastewater Treatment yard around the Chandler air-monitoring site (04-013-0021). The remodeling is scheduled in two to three years. MCESD looked for a new site comparable to and in the same general area as the existing site. The Higley ADEQ site was found to have similar land use patterns as Chandler. A particulate monitor was established in May 2000 with the purpose of comparing both sets of data. Since the Chandler Site has a particulate monitor that is designated as NAMS, sufficient data must be collected to make a comprehensive comparison between the two sites. Analysis of the data has shown that the Higley Site is equivalent to the Chandler Site.

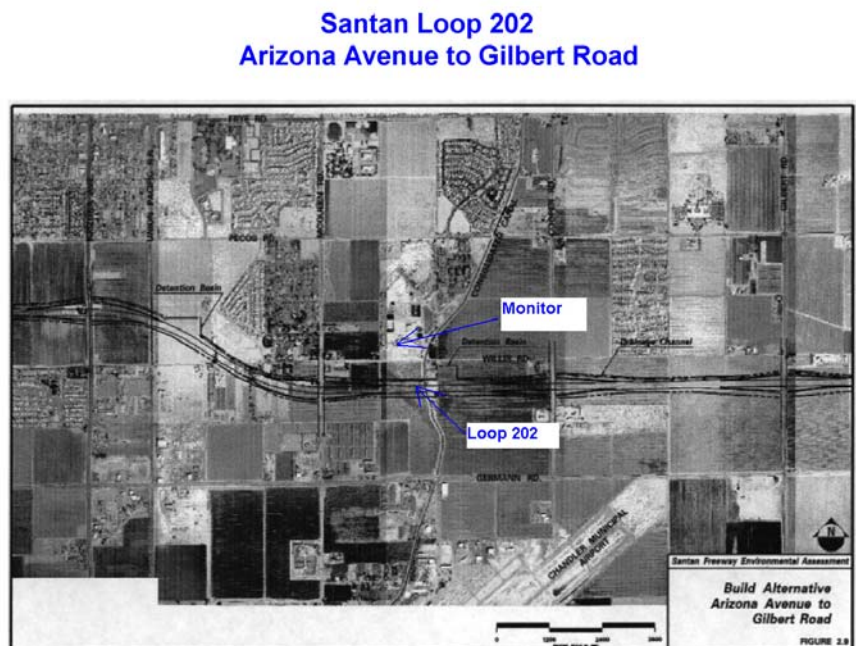


Fig. 2

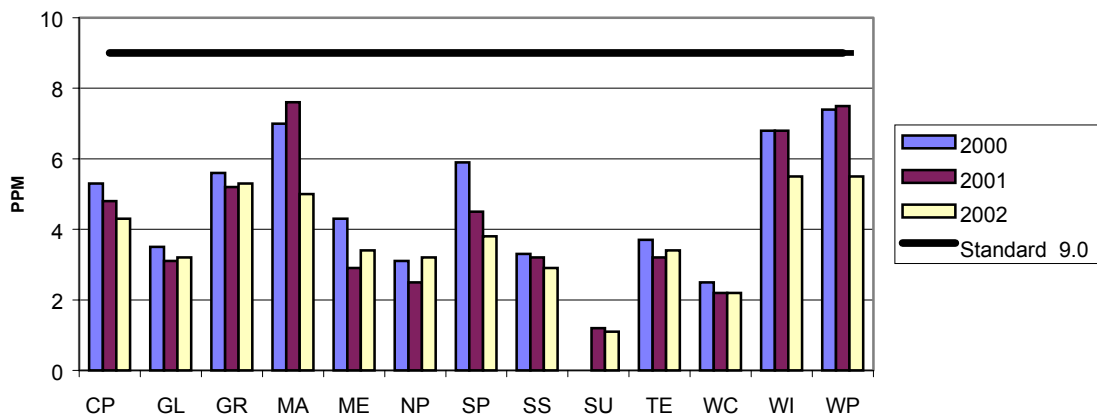
In addition, MCESD has learned that the Chandler site will be less than a half of a mile (north) of the construction of the Santan Loop 202 (Fig.2). That part of the freeway is scheduled for construction in 2005-2007. With such a large construction project, MCESD believes that the monitor should remain at its current location as long as possible to monitor before, during, and after freeway construction. However if the City of Chandler still needs us to remove the monitor the Higley Site will be used as a replacement site.

POLLUTION TRENDS

The following charts are three-year trends for the criteria pollutants:

Carbon Monoxide

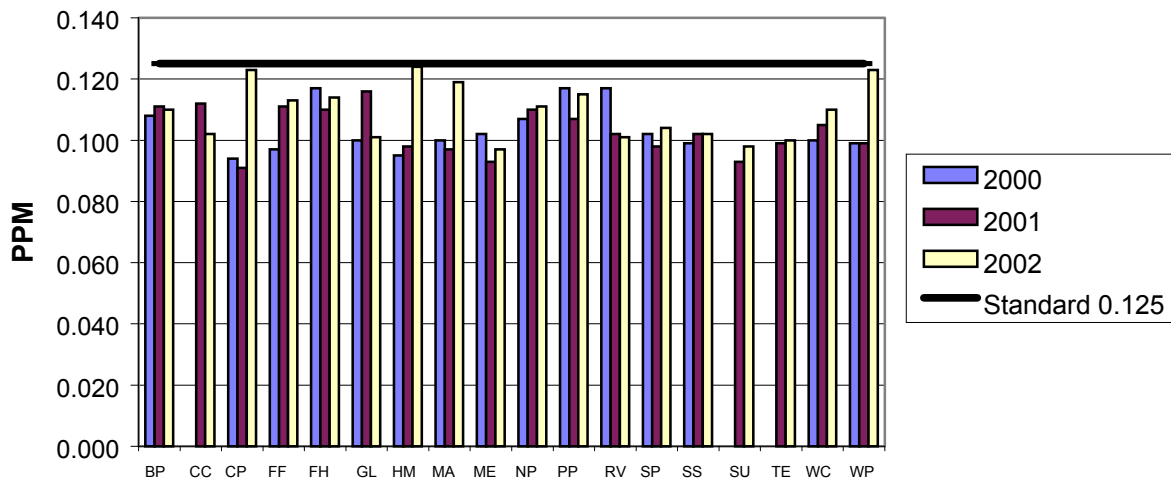
Maricopa County 2000-2002 Carbon Monoxide Max 8-hr Avg.
(Chart -1)



(Chart -1)

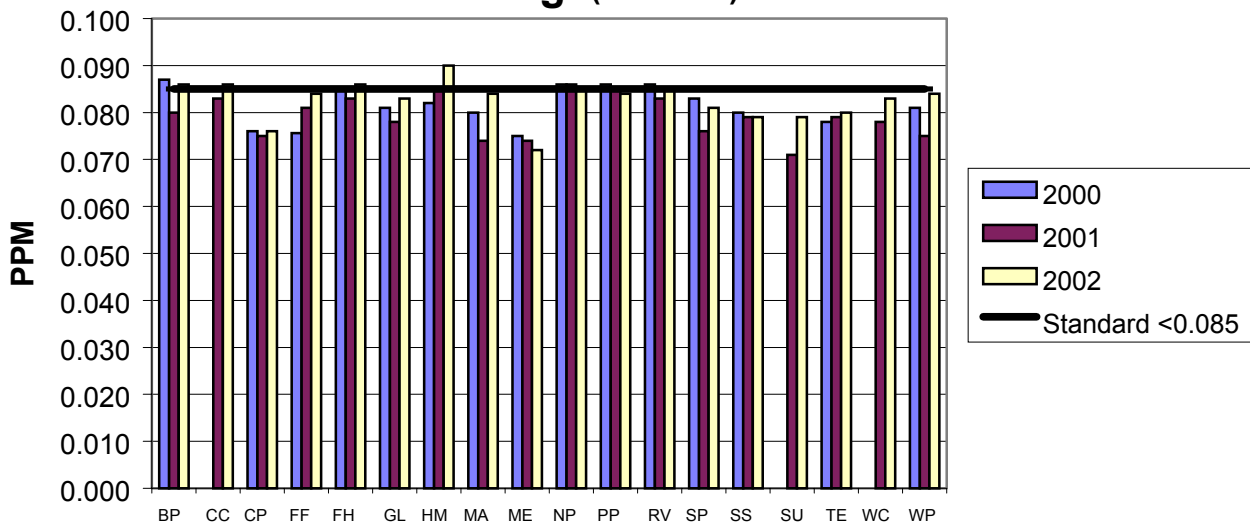
Ozone

Maricopa County 2000-2002 Ozone Max 1-hr Avg.
(Chart -2)



(Chart -2)

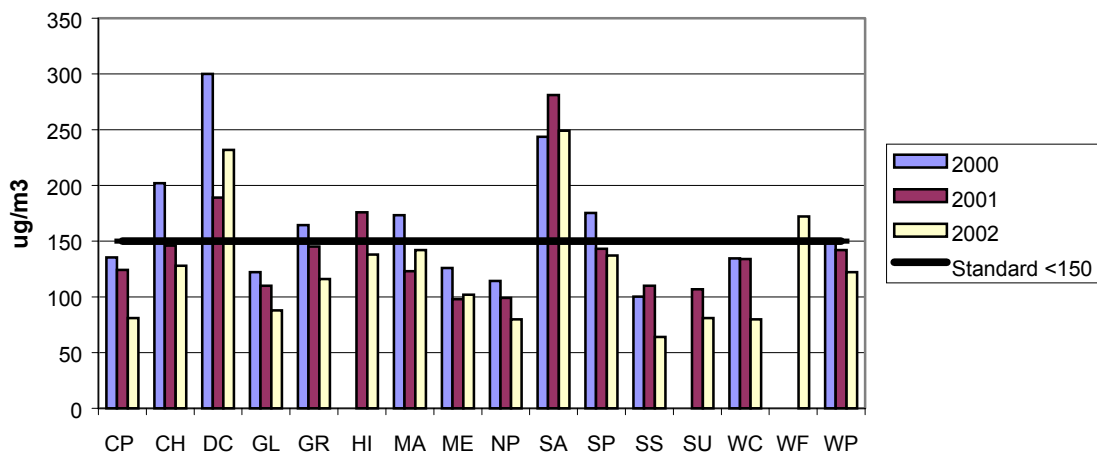
Maricopa County 2000-2002 Ozone 4th high 8-hr Avg. (Chart -3)



(Chart -3)

Particulates

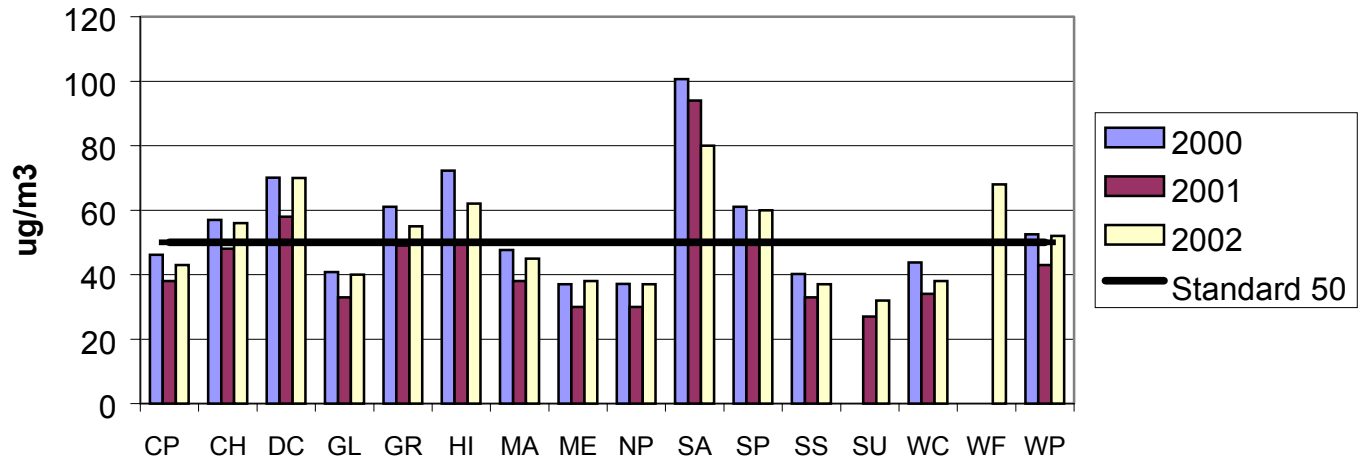
2000 - 2002 PM-10 24-hr Max.



(Chart -4)

Maricopa County 2000-2002 PM-10 Annual Avg.

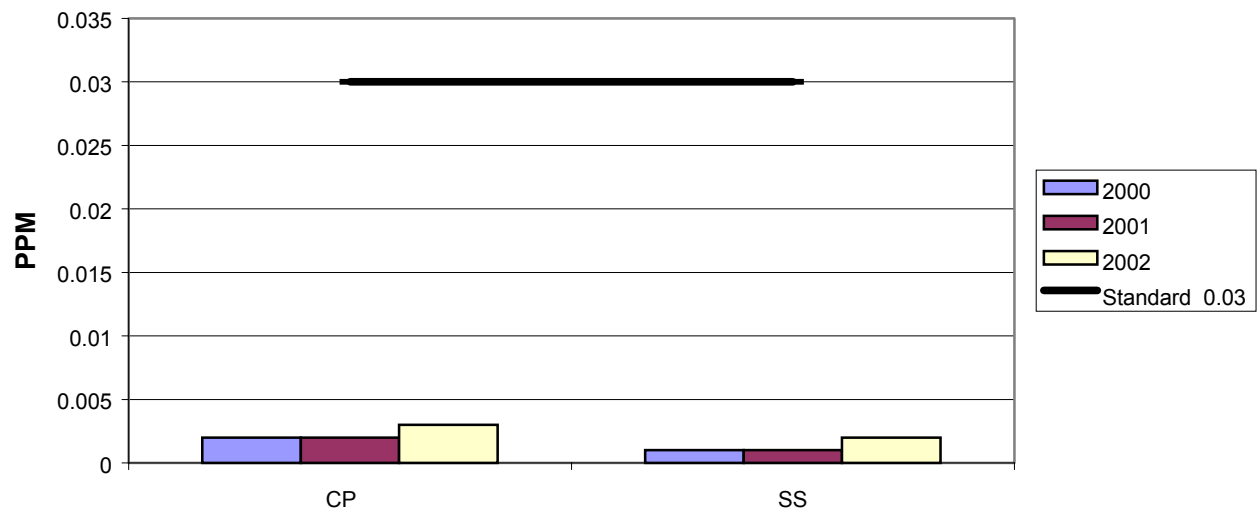
(Chart -5)



(Chart -5)

Sulfur Dioxide

Maricopa County 2000 - 2002 Sulfur Dioxide
Annual Avg.
(Chart-6)

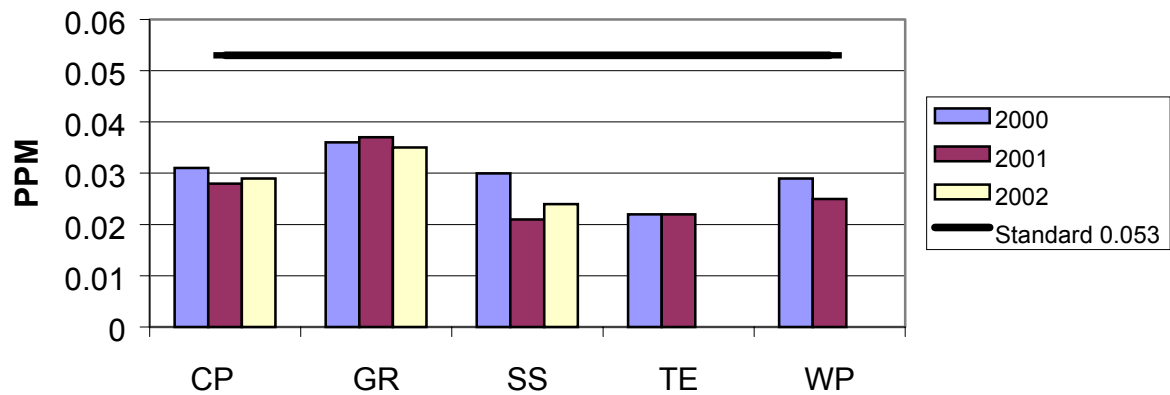


[M1]SuSSSS

(Chart -6)

Nitrogen Dioxide

Maricopa County 2000-2002 Nitrogen
Dioxide Annual Average Readings
(Chart -7)



(Chart -7)

Acronyms and Abbreviations

Acronym or Abbreviation	Definition
ADEQ	Arizona Department of Environmental Quality
ADOT	Arizona Department of Transportation
CFR	Code of Federal Regulations
Class I	Federally designated park or wilderness area with mandated visibility protection
CO	Carbon monoxide
Delta T	Difference between two levels of temperature measurements
EPA	U. S. Environmental Protection Agency
HAPs	Hazardous air pollutants
km	Kilometers
m	Meters
MCESD	Maricopa County Environmental Services Department
$\mu\text{g}/\text{m}^3$	Microgram per cubic meter
NAAQS	National Ambient Air Quality Standards
NAMS	National Air Monitoring Station
NO_2	Nitrogen dioxide
NO_x	Sum of NO and NO_2
O_3	Ozone
Pb	Lead
PM	Particulate matter
PM-2.5	Particulate matter ≤ 2.5 microns
PM-10	Particulate matter ≤ 10 microns
PPB	Parts per billion
PPM	Parts per million
SIP	State implementation plan
SLAMS	State and local air monitoring station
SO_2	Sulfur dioxide
SPM	Special purpose monitor
TEOM	Tapered element oscillating Microbalance
TSP	Total suspended particulate
USFS	U.S. Forest Service
VOC	Volatile organic compounds

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3. Air Quality Modeling of Carbon Monoxide Concentrations in Support of the Federal Implementation Plan for Phoenix, AZ, SYSAPP-93/039, Systems Application International, San Rafael, CA, April 30, 1993.
4. Code of Federal Regulations, Chapter 40, Part 58, Appendix D, 1997.
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7. <http://www.epa.gov/rgytgrnj/programs/artd/air/quality/quality.htm>
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10. <http://www.epa.gov/empact>
11. <http://www.epa.gov/oar/aqtrnd00/sixpoll.html>
12. MCESD 2001 Network Review (<http://www.maricopa.gov/envsvc/AIR/AIRDAY/review1a.pdf>)
13. SLAMS / NAMS / PAMS Network Review Guidance--EPA-454/R-98-003
14. Guideline on data handling conventions of the PM NAAQS

Appendix

Preliminary ADEQ Air Monitoring Data Y2002 data for Maricopa County

Ozone 1 - Hour Average

	Supersite Site	Date		Palo Verde Site	Date
Max (PPM)	.117	7/11		.092	7/10
2 nd	.110	7/09		.090	7/09
3rd	.094	7/12		.085	5/13
4th	.088	7/17		.085	6/18
# of Exceedances	0			0	
# of Sample Hours	6486			4445	

Ozone 8 - Hour Average

	Supersite Site	Date		Palo Verde Site	Date
Max (PPM)	.093	7/09		.085	7/10
2 nd	.089	7/11		.080	5/13
3rd	.083	7/12		.080	7/09
4th	.076	7/10		.078	6/05
# of Exceedances	2			1	
# of Sample Days	6452			4415	

